



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

November 8, 2016

Mr. George A. Lippard, III  
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 05000395/2016003**

Dear Mr. Lippard:

On September 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Virgil C. Summer Nuclear Station, Unit 1. On October 27, 2016, 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.

NRC inspectors documented one NRC-identified and one self-revealing finding of very low safety significance (Green) in this report. The findings involved violations of NRC requirements. The inspectors also documented one licensee-identified violation, which was 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.

G. Lippard III

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This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

**/RA/**

Anthony D. Masters, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

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

Enclosure:  
IR 05000395/2016003  
w/Attachment: Supplemental Information

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Letter to George A. Lippard III from Anthony D. Masters dated November 8, 2016

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1 – NRC INTEGRATED  
INSPECTION REPORT 05000395/2016003

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**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No. 50-395

License No. NPF-12

Report Nos. 05000395/2016003

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: July 1, 2016, through September 30, 2016

Inspectors: J. Reece, Senior Resident Inspector  
E. Coffman, Resident Inspector  
C. Dykes, Health Physicist (Section 2RS7)  
W. Loo, Sr. Health Physicist (Sections 1EP2, 1EP, 3, IEP4, IEP5,  
2RS8, 4OA1.2)  
J. Rivera, Health Physicist (Sections 2RS1, 4OA1.3)  
J. Panfel, Health Physicist (Sections 2RS6, 4OA1.3)  
C. Fontana, Emergency Preparedness Inspector (Sections 1EP2,  
1EP3, 1EP4, 1EP5, 4OA1.2)  
J. Hickman, Emergency Preparedness Inspector (Sections 1EP2,  
1EP3, 1EP4, 1EP5, 4OA1.2)

Approved by: Anthony D. Masters, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

Enclosure

## SUMMARY

IR 05000395/2016003; 07/01/2016 - 09/30/2016: Virgil C. Summer Nuclear Station, Unit 1; Radiological Hazard Assessment and Exposure Controls; Problem Identification and Resolution.

The report covered a three-month period of inspection by resident and regional inspectors. One NRC-identified and one self-revealing violations were 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 6.

### A. NRC-Identified and Self-Revealing Findings

#### **Cornerstone: Mitigating Systems**

- Green. The inspectors identified a Green, non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," involving the failure to prescribe instructions for a temporary repair of the safety-related 'C' component cooling water (CCW) pump outboard bearing. The licensee entered condition report, CR-16-04576, in their corrective action program for appropriate response.

The inspectors determined that the failure to prescribe documented work instructions of a type appropriate to the circumstances for the temporary repair of the 'C' CCW pump outboard bearing was a performance deficiency (PD). The inspectors reviewed IMC 0612, Appendix B, "Issue Screening," dated September 7, 2012, and determined that the PD was more than minor and therefore a finding because it impacted the Mitigating Systems Cornerstone by adversely affecting the cornerstone objective to ensure in part the availability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the design control attribute was impacted because not prescribing instructions that follow vendor instructions for temporary repairs on the safety-related pump resulted in improper repairs causing reasonable doubt in operability. The inspectors evaluated the finding in accordance with IMC 0609, "Significant Determination Process," Attachment 4 and Appendix A, and determined that the finding was of very low safety significance, Green, because it did not represent an actual loss of a safety-related train since the 'C' CCW pump was operable but degraded. 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 Human Performance and the aspect of resources, H.1, because the licensee failed to ensure instructions were adequate and available to support nuclear safety-related work. (Section 4OA2.2)

#### **Cornerstone: Occupational Radiation Safety**

- Green. The inspectors identified two examples of a Green, self-revealing, non-cited violation (NCV) of Technical Specification (TS) 6.12.1, "High Radiation Area." TS 6.12.1 requires that entries into high radiation areas (HRAs) be controlled with

issuance of a radiation work permit (RWP) and that individuals entering these areas be made knowledgeable of the dose rates. Contrary to that, on two separate occasions, workers made entries into HRAs without being issued an appropriate RWP and without being knowledgeable of area dose rates. Specifically, on March 28, 2016, a worker tagging a pump on the auxiliary building (AB) 400-01 slab entered a HRA without the required radiological briefing and appropriate RWP. Also, on April 18, 2016, a worker performing dry cask welding operations in the fuel handling building entered a HRA without the required radiological briefing and appropriate RWP. The licensee entered these events into their corrective action program as condition reports CR-16-01528 and CR-16-01863.

This finding was more than minor because it is associated with the Occupational Radiation Safety Cornerstone attribute of Human Performance and adversely affects the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. The finding was not related to As Low As Reasonably Achievable planning, nor did it involve an overexposure or substantial potential for overexposure and the ability to assess dose was not compromised. Therefore, the finding was determined to be of very low safety significance (Green). This finding involved the cross-cutting aspect of Avoid Complacency (H.12) because in both examples there were repostings, radiation areas were upgraded to HRAs due to changing radiological conditions, and prior to entry the workers failed to stop and get updated conditions and to adhere to the postings.

#### B. Licensee-Identified Findings

One violation of very low safety significance that was identified by the licensee has been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The violation 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 for the remainder of the period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

##### 1R01 Adverse Weather Protection

###### Seasonal Weather Susceptibilities

###### a. Inspection Scope

On September 2, 2016, the inspectors reviewed the licensee's actions associated with operations administrative procedure, OAP-109.1, "Guidelines for Severe Weather," Revision (Rev.) 4D, implemented in response to elevated wind conditions from Tropical Storm Hermine. The inspectors additionally reviewed samples of protected area yard conditions to verify that no potential missile hazards existed for potential tornadic conditions.

###### b. Findings

No findings were identified.

##### 1R04 Equipment Alignment

###### .1 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) 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.

- Partial walkdown of 'A' residual heat removal (RHR) during scheduled maintenance on 'B' RHR train components
- Partial walkdown of 'A' emergency diesel generator (EDG) due to emergent work on 'B' EDG to repair a starting air leak
- Partial walkdown of 'B' component cooling water (CCW) after bearing replacement on 'C' CCW pump, and while 'C' CCW was aligned to 'A' CCW train during post maintenance testing



- Partial walkdown of 'B' motor driven emergency feedwater (MDEFW) and turbine driven emergency feedwater (TDEFW) during scheduled maintenance 'A' MDEFW

b. Findings

No findings were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors performed a detailed review and walkdown of 'A' CCW system to identify any discrepancies between the current operating system equipment lineup and the designed lineup. In addition, the inspectors reviewed SOPs, applicable sections of the final safety analysis report (FSAR), design basis document, plant drawings, completed surveillance procedures, outstanding WOs, system health reports, and related CRs to verify that the licensee had properly identified and resolved equipment problems that could affect the availability and operability of the system.

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 six areas (respective fire zones also noted):

- Control building 463 elevation (fire zone CB-17.1)
- 1DA switchgear room (fire zone IB-20)
- 1DB switchgear rooms and heating, ventilation, air conditioning (HVAC) rooms (fire zones IB-16, IB-17, IB-22.2)
- Control building cable spreading rooms (fire zones CB-4, CB-15)
- Intermediate building (fire zones IB-25.1.1, 1.2, 1.3, 1.5)
- Fire service (FS) pumps and alternate FS pump areas (fire zones AFSPH01, CWPH02, CWPH01)

b. Findings

No findings were identified.

.2 Annual Fire Brigade Drill Observation

a. Inspection Scope

The inspectors observed the performance of an announced fire brigade drill with offsite participation on August 27, 2016. 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.

1R11 Licensed Operator Regualification Program

.1 Licensed Operator Regualification

a. Inspection Scope

The inspectors observed an operator regualification simulator training scenario occurring on September 6, 2016, 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 any 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.

- Movable rod insertion testing
- 'B' EDG post maintenance test and surveillance test

### b. Findings

No findings were identified.

## .3 Annual Review of Licensee Regualification Examination Results

### a. Inspection Scope

On September 9, 2015, the licensee completed the comprehensive biennial regualification written examinations and the annual regualification 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), "Regualification 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 Regualification Program." These results were compared to the thresholds established in Section 3.02, "Regualification 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 two CRs 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 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-16-03934, 'B' EDG declared inoperable due to air leak on main air start valve 'A'
- CR-16-03655, 'A' chiller declared nonfunctional due to circuit 1 hot gas bypass valve failure lowering capacity below design

b. Findings

No findings relative to application of the Maintenance Rule were identified.

1R13 Maintenance Risk Assessment and Emergent Work Control

a. Inspection Scope

The inspectors performed risk assessments, as appropriate, for the six 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.

- Work week 28, fire emergency procedure (FEP) equipment availability red risk condition for 'B' RHR train inoperable due to scheduled maintenance
- Work week 28, FEP equipment availability red risk condition for alternate seal injection diesel maintenance
- Work week 28, yellow risk condition for 'B' solid state protection system (SSPS) testing
- Work week 33, yellow risk condition for 'A' SSPS testing
- Work week 34, red FEP risk condition for 'A' MDEFW scheduled maintenance
- Work week 36, yellow risk condition for 'B' SSPS testing

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments

a. Inspection Scope

The inspectors reviewed the four 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. 1C, "Operability Determination Process," and SAP-999, Rev. 13C, "Corrective Action Program."

- CR-16-03099, breaker for group 2 pressurizer heaters will not charge
- CR-16-03527, 'C' chiller low oil pressure
- CR-16-04109, 'C' CCW pump outboard bearing noise
- CR-15-05722, past operability for failure of 'B' RHR pump to start on manual attempt during surveillance test procedure (STP)-130.005H, "SI Valve Operability Testing (Mode 5)," Rev. 7C

b. Findings

The enforcement aspects associated with CR-16-04109 are discussed in Section 4OA2.2 in this report.

1R18 Plant Modifications

a. Inspection Scope

The inspectors reviewed one temporary modification implemented by work order as noted below, for adverse effects on system availability, reliability, and functional capability. Documents reviewed included 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.

- WO1612333, Temporary alteration to install new 'C' CCW outboard bearing using Loctite 609 to avoid bearing slippage on shaft

b. Findings

The enforcement aspects associated with WO1612333 are discussed in Section 4OA2.2 in this report.

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. 5F.

- WO 1608932-001, Replace purge exhaust effluent high range rad monitor (detector only)
- WO 1605147-002, Remove 'C' service water (SW) pump upper and lower flow indicator and spool pieces
- WO 1515014, Replace breaker for 'B' RHR pump motor
- WO 1611478, Replace hot gas bypass valves on 'A' chiller
- WO 1612333, Replace outboard bearing on 'C' CCW pump
- WO 1612601, 'C' chiller failed to start

b. Findings

The enforcement aspects associated with WO1612333 are discussed in Section 4OA2.2 in this report.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors observed and/or reviewed the five 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-205.005, "Chemical and Volume Control System Valve Operability Test," Rev. 6A
- STP-205-003, "Charging/Safety Injection Pump and Valve Test," Rev. 8B
- STP-222.002, "Component Cooling Pump Test," Rev. 10A
- STP-123-003B, "Train B Service Water System Valve Operability Test," Rev. 7

Other

- STP-125.002B, "Diesel Generator 'B' Operability Test," Rev. 3

b. Findings

No findings were identified.

## 2. EMERGENCY PREPAREDNESS

Cornerstone: Emergency Preparedness

### 1EP6 Drill Evaluation

#### .1 Emergency Preparedness Drill

##### a. Inspection Scope

On April 6, 2016, the inspectors reviewed and observed the performance of an emergency preparedness (EP) drill that involved tornado strikes within the protected area and Parr Hydro switchyard, loss of an offsite electrical circuit, condensate storage tank damage, inadvertent feedwater isolation signal, anticipated transient without scram event, loss of the emergency feedwater pumps, a reactor coolant system leak, fuel failures, and containment penetration leaks which required entry into increasing emergency action levels starting with a Notification of Unusual Event and ending in a General Emergency. 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.

### 1EP2 Alert and Notification System Evaluation

#### a. Inspection Scope

The inspectors evaluated the adequacy of the licensee's methods for testing and maintaining the alert and notification system in accordance with NRC Inspection Procedure 71114, Attachment 02, "Alert and Notification System Evaluation." The applicable planning standard, 10 CFR Part 50.47(b)(5), and its related 10 CFR Part 50, Appendix E requirements were used as reference criteria. The criteria contained in NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Rev. 1, were also used as a reference.

The inspectors reviewed various documents that are listed in the Attachment and interviewed and observed personnel responsible for system performance, siren maintenance, and siren testing. This inspection activity satisfied one inspection sample for the alert and notification system on a biennial basis.

#### b. Findings

No findings were identified.

### 1EP3 Emergency Response Organization Staffing and Augmentation System

#### a. Inspection Scope

The inspectors reviewed the licensee's Emergency Response Organization (ERO) augmentation staffing requirements and process for notifying the ERO to ensure the readiness of key staff for responding to an event and timely facility activation. The qualification records of key position ERO personnel were reviewed to ensure all ERO qualifications were current. A sample of problems identified from augmentation drills or system tests performed since the last inspection was reviewed to assess the effectiveness of corrective actions.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 03, "Emergency Response Organization Staffing and Augmentation System." The applicable planning standard, 10 CFR 50.47(b)(2), and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

The inspectors reviewed various documents that are listed in the Attachment. This inspection activity satisfied one inspection sample for the ERO staffing and augmentation system on a biennial basis.

#### b. Findings

No findings were identified.

### 1EP4 Emergency Action Level and Emergency Plan Changes

#### a. Inspection Scope

Since the last NRC inspection of this program area, two changes were made to the Radiological Emergency Plan and one change was made to the Emergency Action Levels, along with changes to several implementing procedures. The licensee determined that, in accordance with 10 CFR 50.54(q), the Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The inspectors reviewed these changes to evaluate for potential reductions in the effectiveness of the Plan. However, this review was not documented in a Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety.

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

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

#### b. Findings

No findings were identified.



## 1EP5 Maintenance of Emergency Preparedness

### a. Inspection Scope

The inspectors reviewed the corrective actions identified through the Emergency Preparedness program to determine the significance of the issues, the completeness and effectiveness of corrective actions, and to determine if issues were recurring. The licensee's post-event after action reports, self-assessments, and audits were reviewed to assess the licensee's ability to be self-critical, thus avoiding complacency and degradation of their emergency preparedness program. Inspectors reviewed the licensee's 10 CFR 50.54(q) change process, personnel training, and selected screenings and evaluations to assess adequacy. The inspectors toured facilities and reviewed equipment and facility maintenance records to assess licensee's adequacy in maintaining them. The inspectors evaluated the capabilities of selected radiation monitoring instrumentation to adequately support Emergency Action Level (EAL) declarations.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 05, "Maintenance of Emergency Preparedness." The applicable planning standards, related 10 CFR 50, Appendix E requirements, and 10 CFR 50.54(q) and (t) were used as reference criteria.

The inspectors reviewed various documents that are listed in the Attachment. This inspection activity satisfied one inspection sample for the maintenance of emergency preparedness on a biennial basis.

### b. Findings

No findings were identified.

## 3. RADIATION SAFETY

### 2RS1 Radiological Hazard Assessment and Exposure Controls (Seven Inspection Samples Completed)

#### a. Inspection Scope

Hazard Assessment and Instructions to Workers During facility tours, the inspectors directly observed radiological postings and container labeling for areas established within the radiologically controlled area (RCA), including Unit 1 (U1) auxiliary building, radioactive waste (radwaste) processing and storage locations, and the Independent Spent Fuel Storage Installation (ISFSI). The inspectors independently measured radiation dose rates and directly observed conduct of licensee radiation surveys for selected RCA areas. The inspectors reviewed survey records for several plant areas including surveys for airborne radioactivity, gamma surveys with a range of dose rate gradients, surveys for alpha-emitters and other hard-to-detect radionuclides, and pre-job surveys for upcoming tasks. The inspectors also discussed changes to plant operations that could contribute to changing radiological conditions since the last inspection. 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.

Control of Radioactive Material The inspectors observed surveys of material and personnel being released from the RCA using small article monitor, personnel contamination monitor, and portal monitor instruments. The inspectors discussed equipment sensitivity, alarm setpoints, and release program guidance with licensee staff. The inspectors also reviewed records of leak tests on selected sealed sources and discussed nationally tracked source transactions with licensee staff.

Hazard Control The inspectors evaluated access controls and barrier effectiveness for selected high radiation area (HRA), locked high radiation area (LHRA), and very high radiation area (VHRA) locations and discussed changes to procedural guidance for LHRA and VHRA controls with radiation protection (RP) supervisors. The inspectors reviewed implementation of controls for the storage of irradiated material within the spent fuel pool. Established radiological controls, including airborne controls and electronic dosimeter (ED) alarm setpoints, were evaluated for activities related to Refueling Outage 22 (RF-22), dry cask ISFSI campaign, and U1 reactor building at-power entries. In addition, the inspectors reviewed licensee controls for areas where dose rates could change significantly as a result of plant shutdown and refueling operations. The inspectors also reviewed the use of personnel dosimetry, including extremity dosimetry and multibadging in high dose rate gradients.

Radiation Worker Performance and RP Technician Proficiency Occupational workers' adherence to selected RWPs and RP technician proficiency in providing job coverage were evaluated through the review of RWP packages and interviews with licensee staff. The inspectors also evaluated worker responses to dose and dose rate alarms.

Problem Identification and Resolution The inspectors reviewed and assessed condition reports associated with radiological hazard assessment and control. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with licensee procedures. The inspectors also reviewed recent self-assessment results.

Inspection Criteria Radiation protection activities were evaluated against the requirements of Updated Final Safety Analysis Report (UFSAR) Section 12, Technical Specifications (TS) Sections 6.11 and 6.12, 10 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 and records reviewed are listed in the Attachment.

b. Findings

Introduction: The inspectors identified a Green, self-revealing, non-cited violation (NCV) of TS 6.12.1, "High Radiation Area," with two examples, for individuals who entered HRAs without being issued an appropriate RWP and without being knowledgeable of area dose rates.

Description: On March 28, 2016, a worker tagging a pump in the auxiliary building (AB) 400-01 slab (room containing equipment associated with the letdown line), entered a posted HRA without a HRA pre-job briefing required by site health physics procedure (HPP)-0401.003, Rev. 2A, "Performing RWP Pre-Job Briefings," Section 4.1.2, "High Radiation Area Pre-Job Briefings." This worker subsequently received an ED dose rate alarm. Accessible general area dose rates based on surveys in the area near the time

of the event were as high as 450 mrem/hr at 30 centimeters. In addition, on April 18, 2016, another worker performing dry casks welding inspections in the fuel handling building entered a posted HRA without the required HRA pre-job briefing, and also received an ED dose rate alarm. Accessible general area dose rates based on surveys in the area near the time of the event were as high as 200 mrem/hr at 30 centimeters. Upon receiving the alarms, both individuals immediately exited the RCA and reported to the health physics shift lead.

In both cases, the workers had only been briefed to enter radiation areas (RAs) with dose rates less than 100 mrem/hr and were not on RWPs that allowed entry into a HRA. In addition, the areas the workers entered both had recently been re-posted from RAs to HRAs. The workers had made prior entries into these areas when they were posted as RAs; however the individuals did not notice the postings had changed and proceeded past the HRA boundaries. The licensee entered these events into the CAP (CR-16-01528 and CR-16-01863). Immediate corrective actions included removal of the workers from the RCA, and coaching of the individuals on adhering to RWP requirements and reading postings.

Analysis: The inspectors determined that entry into HRAs without meeting the entry requirements specified in TS 6.12.1 was a performance deficiency (PD). This finding is more-than-minor because it is associated with the Occupational Radiation Safety Cornerstone attribute of Human Performance and adversely affects the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Workers who enter HRAs with inadequate knowledge of actual radiological conditions could receive unintended occupational exposures. The finding was evaluated using the Occupational Radiation Safety Significance Determination Process (SDP). The finding was not related to As Low As Reasonably Achievable (ALARA) planning, nor did it involve an overexposure or substantial potential for overexposure, and the ability to assess dose was not compromised. Therefore, the finding was determined to be of very low safety significance (Green). The inspectors noted that the workers responded properly to the ED dose rate alarms thereby limiting their potential for unintended exposure. This finding involved the cross-cutting aspect of Human Performance, Avoid Complacency [H.12] because in both examples the workers had previously entered these same areas while posted as radiation areas (RAs), however the workers failed to adhere to updated HRA postings prior to entering these areas again.

Enforcement: TS 6.12.1 requires that in lieu of the “control device” or “alarm signal” required by paragraph 20.1601(a) of 10 CFR Part 20, each high radiation area (HRA) in which the intensity of radiation is greater than 100 millirem per hour (mrem/hr) but less than 1000 mrem/hr shall be barricaded and conspicuously posted as a HRA and entrance thereto shall be controlled by requiring issuance of an RWP. In addition, TS 6.12.1 requires that workers must be knowledgeable of area dose rates prior to entry into HRAs. Contrary to this, on two separate occasions workers made entries into HRAs without being issued an appropriate RWP and without having knowledge of area dose rates. Because this violation was of very low safety significance and it was entered into the licensee’s CAP (CR-16-01528 and CR-16-01863), this violation is being treated as an NCV, consistent with the Enforcement Policy: NCV 05000395, 2016003-01, Failure to Meet HRA Entry Requirements (Two Examples)

## 2RS6 Radioactive Gaseous and Liquid Effluent Treatment (Six Inspection Samples Completed)

### a. Inspection Scope

Radioactive Effluent Treatment Systems The inspectors walked down selected components of the gaseous and liquid radwaste processing and effluent discharge systems. To the extent practical, the inspectors observed and evaluated the material condition of in-place waste processing equipment for indications of degradation or leakage that could constitute a possible release pathway to the environment. Inspected components included waste monitor tanks, floor drain tanks, effluent monitoring equipment, and associated piping and valves. The inspectors interviewed licensee staff regarding equipment configuration and effluent monitor operation. The inspectors also walked down and reviewed surveillance test records for the auxiliary building exhaust filtration systems.

Effluent Sampling and Discharge The inspectors observed the collection and processing of liquid effluent samples from Waste Monitor Tanks A and B. Technician proficiency in collecting, processing, and preparing the applicable release permits was evaluated. The inspectors reviewed recent liquid and gaseous release permits including pre-release sampling results, effluent monitor alarm setpoints, and public dose calculations. For effluent monitors RMA3, RML5, RMA9, RML9, and RMA14, the inspectors reviewed calibration and functional test records and evaluated traceability of radioactive calibration sources to National Institute of Standards and Technology (NIST) standards. The inspectors also evaluated the licensee's capability to collect high-range post-accident effluent samples from these monitoring systems. The inspectors reviewed and discussed with licensee staff methodology for determining vent and stack flow rates and compared current vent flows to design values.

The inspectors also reviewed compensatory sampling data for time periods when selected radiation monitors were out of service. The inspectors reviewed the results of interlaboratory cross-checks for laboratory instruments used to analyze effluent samples. The inspectors also reviewed licensee effluent source term characterizations and changes to effluent release points. In addition, the inspectors evaluated recent land use census results.

The inspectors reviewed the 2015 Annual Radioactive Effluent Report to evaluate reported doses to the public, to review any anomalous events, and to review Offsite Dose Calculation Manual (ODCM) changes.

Problem Identification and Resolution The inspectors reviewed and discussed selected CAP documents associated with gaseous and liquid effluent processing and release activities including licensee sponsored assessments. The inspectors evaluated the licensee's ability to identify and resolve issues.

Inspection Criteria Radwaste system operation and effluent processing activities were evaluated against requirements and guidance documented in the following: 10 CFR Part 20; 10 CFR Part 50 Appendix I; ODCM; UFSAR Sections 11 and 12; Regulatory Guide (RG) 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants"; RG 1.109, "Calculation of Annual Doses to Man from

Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50 Appendix I"; and TS Section 6. Documents reviewed during the inspection are listed in the report Attachment.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (REMP) (Three Inspection Samples Completed)

a. Inspection Scope

REMP Implementation The inspectors reviewed the 2014 and 2015 Annual Radiological Environmental Operating Reports. Selected environmental measurements were reviewed for consistency with licensee effluent data, evaluated for radionuclide concentration trends, and compared with detection level sensitivity requirements as described in the ODCM. The inspectors assessed the licensee's response to any missed or anomalous environmental samples. The inspectors also reviewed the results of interlaboratory cross-checks for laboratory instruments used to analyze environmental samples. Any changes to the ODCM, Land Use Census, or environmental program processes were discussed with licensee staff.

The inspectors observed routine collection of surface water samples, airborne particulate and iodine samples at selected locations as required by the licensee's ODCM. Inspectors also observed multiple locations of vegetation samples. The inspectors noted the material condition of the continuous air samplers and environmental dosimeters. The inspectors also reviewed calibration and maintenance records for the environmental sampling equipment.

Meteorological Monitoring Program The inspectors observed the physical condition of the meteorological tower and its instrumentation and discussed equipment operability and maintenance history with licensee staff. The inspectors observed that the meteorological data readout in the control room is operable. Calibration records for the meteorological measurements of wind speed, wind direction, and temperature were reviewed.

Ground Water Protection The inspectors reviewed the licensee's continued implementation of the industry's Ground Water Protection Initiative (Nuclear Energy Institute (NEI) 07-07) and discussed any changes to the program. The inspectors discussed program guidance for dealing with spills, leaks, and unexpected discharges with licensee staff and reviewed recent monitoring well results and any voluntary communications. The inspectors also reviewed the latest entries into the 10 CFR 50.75(g) decommissioning file. The inspectors reviewed and discussed the licensee's program for monitoring of structures, systems, and components with the potential to release radioactive material to the environment. Potential effluent release points due to onsite surface water bodies were also evaluated.

Problem Identification and Resolution The inspectors reviewed CAP documents in the areas of radiological environmental monitoring and meteorological tower maintenance.

The inspectors evaluated the licensee's ability to identify and resolve the issues. The inspectors also reviewed recent self-assessment results.

Inspection Criteria The inspectors evaluated REMP implementation, meteorological monitoring, and groundwater protection against the requirements and guidance contained in: 10 CFR Part 20; Appendices E and I to 10 CFR Part 50; TS Sections 6.0; ODCM; UFSAR; RG 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants," Rev. 1; NEI 07-07, "Industry Groundwater Protection Initiative – Final Guidance Document"; and approved licensee procedures.

b. Findings

No findings were identified.

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (Six Inspection Samples Completed)

a. Inspection Scope

Radioactive Material Storage The inspectors walked down indoor and outdoor areas inside the protected area as well as the hot warehouse. During the walk downs, the inspectors observed the physical condition and labeling of storage containers and the radiological postings for satellite radioactive material storage areas. The inspectors also reviewed the licensee's radwaste procedures for routine surveys and waste storage.

Radioactive Waste System Walkdown, Characterization and Classification The inspectors walked down accessible sections of the liquid and solid radwaste systems to assess material condition and conformance of equipment with system design diagrams. This included the storage tanks located inside the auxiliary building, areas that contained unused equipment, radwaste control room, and resin processing area. The inspectors discussed the function of radwaste components with the radwaste operator. The inspectors discussed possible changes to the radwaste processing systems with radwaste staff. The processes for the dewatering of resins, spent resin tank recirculation, resin sampling, and transfer of resins from the resin processing area to the shipping casks and temporary storage casks were reviewed and discussed with radwaste staff.

The inspectors reviewed the 2015 Radioactive Effluent Release Report and the 2015 - 2016 radionuclide characterization and classification for the dry active waste (DAW) and dewatered resin waste streams. The inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined quality assurance comparison results between licensee waste stream characterizations and outside laboratory data. The inspectors also evaluated how changes to plant operational parameters were taken into account in waste characterization.

Shipment Preparation and Records The inspectors observed the preparation and shipment activities for a reactor coolant pump motor stator. The inspectors reviewed five shipping records for consistency with licensee procedures and compliance with NRC and Department of Transportation (DOT) regulations. This included review of emergency response information, waste classification, radiation survey results, information on the waste manifest, and the authorization of the receiving licensee to

receive shipments. Training records for selected individuals currently qualified to ship radioactive material were reviewed for compliance with 49 CFR Part 172 Subpart H.

Problem Identification and Resolution The inspectors reviewed CAP documents in the areas of radwaste/shipping. The inspectors evaluated the licensee's ability to identify and resolve the issues. The inspectors also reviewed recent self-assessment results.

Inspection Criteria Radioactive material and waste storage activities were reviewed against the requirements of 10 CFR Part 20. Radwaste processing activities and equipment configuration were reviewed for compliance with the licensee's Process Control Program. Waste stream characterization analyses were reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 61, and guidance provided in the Branch Technical Position on Waste Classification (1983). Transportation program implementation was reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 71 (which requires licensees to comply with DOT regulations in 49 CFR Parts 107, 171-180, and 390-397), as well as the guidance provided in NUREG-1608. Training activities were assessed against 49 CFR Part 172 Subpart H. Documents reviewed are listed in the Attachment.

b. Findings

No findings identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Mitigating Systems Cornerstone

a. Inspection Scope

The inspectors verified the accuracy of the licensee's PI submittals listed below for the period October 1, 2015 through September 30, 2016. 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. 3, "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.

## .2 Emergency Preparedness Cornerstone

### a. Inspection Scope

The inspectors sampled licensee submittals relative to the PIs listed below for the period July 1, 2015, through June 30, 2016. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Rev. 7, was used to confirm the reporting basis for each data element.

#### Emergency Preparedness Cornerstone

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

For the specified review period, the inspectors examined data reported to the NRC, procedural guidance for reporting PI information, and records used by the licensee to identify potential PI occurrences. The inspectors verified the accuracy of the PI for ERO drill and exercise performance through review of a sample of drill and event records. The inspectors reviewed selected training records to verify the accuracy of the PI for ERO drill participation for personnel assigned to key positions in the ERO. The inspectors verified the accuracy of the PI for alert and notification system reliability through review of a sample of the licensee's records of periodic system tests. The inspectors also interviewed the licensee personnel who were responsible for collecting and evaluating the PI data. Licensee procedures, records, and other documents reviewed within this inspection area are listed in the Attachment. This inspection satisfied three inspection samples for PI verification on an annual basis.

### b. Findings

No findings were identified.

## .3 Occupational Radiation Safety Cornerstone

### a. Inspection Scope

The inspectors reviewed the Occupational Exposure Control Effectiveness PI results for the Occupational Radiation Safety Cornerstone from June 2015 through June 2016. For the assessment period, the inspectors reviewed electronic dosimeter alarm logs and CRs related to controls for exposure significant areas. Documents reviewed are listed in the Attachment.

### b. Findings

No findings were identified.



.4 Public Radiation Safety Cornerstone:

a. Inspection Scope

The inspectors reviewed the Radiological Control Effluent Release Occurrences PI results for the Public Radiation Safety Cornerstone from July 2015 through July 2016. For the assessment period, the inspectors reviewed cumulative and projected doses to the public contained in liquid and gaseous release permits and CRs related to radiological effluent TS/ODCM issues. The inspectors also reviewed licensee procedural guidance for collecting and documenting PI data. Documents reviewed are listed in the Attachment.

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," 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-16-04109

a. Inspection Scope

The inspectors reviewed CR-16-04109, abnormal noise coming from 'C' CCW outboard pump bearing, 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. 13C.

b. Findings

Introduction: The inspectors identified a Green, non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," involving the failure

to prescribe instructions for a temporary repair of the safety-related 'C' component cooling water (CCW) pump outboard bearing.

Description: On August 14, 2016, during surveillance testing of the 'C' CCW pump the licensee identified an abnormal noise from the outboard pump bearing, and condition report, CR-16-04109, with respective work order, WO1612316, was initiated. Subsequently, the licensee found that the bearing locknut was loose prompting further investigation which revealed the inner bearing race was rotating on the pump shaft. This resulted in shaft scoring and wear as noted by measurements indicating the shaft outside dimension was .002 inches less than vendor specifications. The licensee did not have a spare shaft and consequently performed a temporary repair, accompanied by an operability evaluation concluding operable but degraded, which the residents reviewed in detail.

The inspectors interviewed licensee staff who reported they decided to perform what they characterized as a non-safety temporary repair or 'abatement' process to abate further degradation of the shaft. The inspectors noted that CR-16-04109, Action 2, stated, "the retaining compound [Loctite 609] is not considered a SR [safety-related] function but is being used to avoid further damage to the fit." The inspectors reviewed the licensee's 50.59 screen which concluded the repair did not require procedure changes and would have no impact on the ability of the pump to perform its design function. The inspectors noted that WO1612316 completion remarks documented the use of Loctite 609 to adhere a new bearing to the shaft for the temporary repair which was completed at 1747 hours on August 16, 2016. The post maintenance test (PMT) was conducted on August 17, 2016, and ran for two intervals for slow and fast speed testing, 1102 – 1133 hours and 1153 – 1213 hours, respectively.

The inspectors noted that issues with Loctite have previously occurred in the industry. The NRC documented this in Information Notice 84-53, "INFORMATION CONCERNING THE USE OF LOCTITE 242 AND OTHER ANAEROBIC ADHESIVE/SEALANTS," which states in part, "Technical and maintenance personnel alike are advised to maintain familiarity with the most current product data sheets for Loctite and similar materials that they use and particularly to utilize nuclear grade materials in appropriate applications."

The inspectors acquired the Loctite 609 Technical Data Sheet, dated September 2014, and contacted the respective vendor, Henkel Adhesives, technical support group to review installation instructions and obtain any other relevant information associated with the use of Loctite in the licensee's temporary repair. The inspectors noted that the licensee failed to prescribe work instructions appropriate to the circumstances in either WO1612316, Step 2, or CR-16-04106, Action 2, for the following aspects involving installation instructions and other related information from the vendor regarding Loctite 609 and other related adhesives:

- Use of the appropriate Loctite product for the work application involving stainless steel (the vendor recommended Loctite 680 versus 609 because the adhesive strength of 609 with stainless steel is up to 50 percent less than use with carbon steel; the pump shaft is stainless steel);
- Ensuring the Loctite product shelf life (two years specified by the vendor) and storage requirements were met by noting the batch code (contains manufacturing date) and documenting the storage location to ensure temperature requirements were met;

- Cleaning surfaces with recommended solvent prior to Loctite application;
- Use of any required activators to ensure adequate cure time of the Loctite; and
- Specification of cure times prior to placing the repaired item under stress.

The inspectors interviewed the plant maintenance personnel and determined that no documentation or work instructions detailing cure time existed, but there were discussions of cure time. The inspectors determined from review of tag-outs, work orders and control room logs that for Loctite 609 a cure time of 24 hours for stainless steel as recommended by the vendor was not met. Additionally, the inspectors determined that the shaft surface was not cleaned, but lightly sanded, and that the tube of Loctite 609 was obtained from a machinist's tool box as opposed to a new tube from the warehouse.

The inspectors noted that 10 CFR 50, Appendix B, Criterion V, states in part that activities affecting quality shall be prescribed by documented instructions of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions. The inspectors concluded that the licensee failed to prescribe sufficient documented instructions in order to accomplish a temporary repair that would allow the pump to accomplish its mission time during an accident with reasonable assurance. Indeed, the inspectors also noted that the licensee "Maintenance Services Administrative Procedure Uniform Procedure Guidelines," MSI-002, Rev. 11B, states in step 7.9, "Technical content and requirements or procedure shall reflect recommendations, commitments, and/or requirements of appropriate reference material (i.e., Vendor Manual, FSAR, and Technical Specification). Any deviations will be approved by Plant Support Engineering during review of procedure, prior to implementation."

The licensee entered condition report, CR-16-04576, in their corrective action program for appropriate response.

Analysis: The inspectors determined that the failure to prescribe documented work instructions of a type appropriate to the circumstances for the temporary repair of the 'C' CCW pump outboard bearing was a performance deficiency (PD). The inspectors reviewed IMC 0612, Appendix B, "Issue Screening," dated September 7, 2012, and determined that the PD was more than minor and therefore a finding because it impacted the Mitigating Systems Cornerstone by adversely affecting the cornerstone objective to ensure in part the availability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the design control attribute was impacted because not prescribing instructions that follow vendor instructions for temporary repairs on the safety-related pump resulted in improper repairs causing reasonable doubt in operability. The inspectors evaluated the finding in accordance with IMC 0609, "Significant Determination Process," Attachment 4 and Appendix A, and determined that the finding was of very low safety significance, Green, because it did not represent an actual loss of a safety-related train since the 'C' CCW pump was operable but degraded. 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 Human Performance and the aspect of resources, H.1, because the licensee failed to ensure instructions were adequate and available to support nuclear safety-related work.

Enforcement: 10 CFR 50, Appendix B, Criterion V, requires in part that activities affecting quality shall be prescribed by documented instructions of a type appropriate to the circumstances. Contrary to this, on August 16, 2016, the licensee failed to prescribe documented work instructions for a temporary repair on the 'C' CCW pump outboard bearing, resulting in a repair that did not follow vendor instructions. Because the finding is of very low safety significance and because it has been entered into the licensee's CAP as CR-16-04576, this violation is being treated as a Green NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000395/2016003-02, Failure to Prescribe Work Instructions for a Temporary Repair on a Safety-Related Component.

### .3 Semi-Annual Review to Identify Trends

#### a. Inspection Scope

The inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The review was focused on repetitive equipment issues, but also considered trends in human performance errors, the results of daily inspector corrective action item screening discussed in Section 4OA2.1 above, licensee trending efforts, and licensee human performance results. The review focused on the previous two years, 2015 and 2016. 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

A licensee identified violation is discussed in Section 4OA7 of this report. The inspectors have continued to monitor the licensee's actions in response to adverse conditions involving fire doors including specialty doors involving multiple functions such as fire, security and steam propagation barriers (SPB). Previous issues and/or findings are documented in the following NRC integrated inspection reports going back to 2013:

- 05000395/2016001
- 05000395/2015004
- 05000395/2015002
- 05000395/2014003
- 05000395/2013004

The inspectors noted a multi-function door (fire, security, SPB), DRAB/514, 463 foot elevation auxiliary building to fuel building, with a total of 12 CRs from both 2016 and 2015 as listed below:

- CR-16-04723: DRAB/514 not securing properly due to air pressure across the door
- CR-16-02036: Door is missing a piece causing the crash bar to not open properly
- CR-16-02029: Crash bar on DRAB/514 is missing a piece
- CR-16-01147: Door is not latching properly
- CR-16-01064: Door came open when checked by security officer after exiting
- CR-16-00621: Door is not closing properly
- CR-15-05881: Door is not securing properly due to a faulty locking mechanism
- CR-15-03309: Door gasket is damaged
- CR-15-03195: Door was found with sheared screw holding door seal

- CR-15-02589: Door found with sheared screw associated with sealing gasket
- CR-15-02078: Unsecure door DRAB/514; found with door slightly out of frame
- CR-15-02002: Multiple alarms on AB514; repaired by security maintenance

The inspectors reviewed various corrective action aspects regarding DRAB/514 and noted that the description of the door in the licensee's CAP is "AUX BLDG SEC/FIRE DOOR," and does not include the SPB function of the door. Consequently, 1) the above CR's where applicable did not get a maintenance rule evaluation assigned; and 2) the operability determinations were inconsistent. The inspectors reviewed CRs initiated prior to 2015 and identified some that did have a maintenance rule evaluation because the CR description included the SPB function. Following a discussion with the licensee regarding these observations, the licensee initiated CR-16-04915 to document and evaluate the adverse trend for corrective actions. And the licensee also initiated CR-16-05073 to document a lack of corrective action for conditions in which the door was found unlatched. The inspectors continue to monitor licensee actions to address adverse door conditions.

#### 4OA6 Meetings, Including Exit

On October 27, 2016, the resident inspectors presented the integrated inspection report results to Mr. George Lippard 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.

#### 4OA7 Licensee-Identified Violations

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

- V.C. Summer Operating License condition 2.c(18) states in part that the licensee shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(c), National Fire Protection Association (NFPA) 805 of which Chapter 3, Section 3.2.3, "Procedures," states, "Procedures shall be established for implementation of the fire protection program." Contrary to this, on September 14, 2016, the licensee failed to implement the requirements of procedure, Fire Protection Procedure, FPP-025, "Fire Containment," Rev. 4, to ensure that fire door and SPB, DRAB/514, remained operable/functional. The inspectors used IMC 0609, "Significant Determination Process," Appendix F, Fire Protection Significance Determination Process, dated September 20, 2013, and performed a Phase 1 analysis to determine the finding was of very low significance or Green. The fire confinement program element was not of low degradation, the non-suppression probability was 0.1, the fire frequencies related to the affected fire zones AB01.21.02 and FH01.04 were 2.79E-3 and 3.98E-4 respectively, and the duration of the component inoperability was approximately 1 hour or 0.000114, which resulted in screening check frequency of 3.63E-8 that was less than the screening criteria of 1E-6. The licensee has documented this problem in their CAP as CR-16-05073.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel**

A. Barbee, Director, Nuclear Training  
T. Bonnette, Supervisor, Emergency Preparedness  
C. Calvert, Manager, Design Engineering  
M. Coleman, Manager, Health Physics and Safety Services  
N. Constance, Manager, Nuclear Training  
G. Douglass, Manager, Nuclear Protection Services  
D. Edwards, Supervisor, Operations  
J. Garza, Supervisor, Nuclear Licensing  
T. Gatlin, Vice President, Nuclear Support Services  
L. Harris, Manager, Quality Systems  
R. Haselden, General Manager, Organizational / Development Effectiveness  
R. Justice, General Manager, Nuclear Plant Operations  
A. Ledbetter, Manager, Planning/Outage  
G. Lippard, Vice President, Nuclear Operations  
R. Mike, Manager, Chemistry Services  
M. Moore, Supervisor, Nuclear Licensing  
R. Ray, Manager, Maintenance Services  
S. Reese, Licensing Specialist  
D. Shue, Manager, Nuclear Operations  
W. Stuart, General Manager, Engineering Services  
T. Tharp, Supervisor, Emergency Preparedness  
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 and Closed**

05000395/2016003-01	NCV	Failure to Meet HRA Entry Requirements (Two Examples)
05000395/2016003-02	NCV	Failure to Prescribe Work Instructions for a Temporary Repair on a Safety-Related Component

## **LIST OF DOCUMENTS REVIEWED**

### **Emergency Preparedness**

#### **Section 1EP2: Alert and Notification System Evaluation**

##### Procedures

EMP-170.003, Warning Siren Maintenance, Revision (Rev.) 14  
Federal Commander Digital Telemetry System Reference Manual, Dated 10/08/13  
Federal Signal Corporation 2001-130 Electro-Mechanical Siren Operating Manual, 2015 Edition  
ORG-01, Organizational Performance Improvement Guidelines, Rev. 1  
VCS-EPMP-100, Maintenance of the Early Warning Siren System (EWSS), Rev. 0  
VCS-EPMP-107, Siren Radio System Maintenance, Rev. 0  
V.C. Summer Alert Notification System Design Report, Rev. 1, Updated 12/01/14

##### Records and Data

2015 and 2016 V.C. Summer Emergency Planning Calendar mailer to members of the public in the 10-mile EPZ  
Documentation of Quarterly Siren Maintenance for 3<sup>rd</sup> Quarter 2014 to 2<sup>nd</sup> Quarter 2016  
Documentation of Bi-weekly Siren Tests and Maintenance for 3<sup>rd</sup> Quarter 2014 to 2<sup>nd</sup> Quarter 2016  
FEMA Alert Notification System Design Report Approval Letter, dated 10/21/14  
Siren Annual Maintenance records: 2015 to 2016

##### Corrective Action Program (CAP) Documents

Condition Report (CR) 14-05820, Siren 93 battery failure  
CR 14-06385, Siren 12 power failure alarm  
CR 14-06610, Siren 7 battery failure  
CR 14-06644, Siren 20 battery failure  
CR 15-01688, Report of siren going off  
CR 15-02742, Siren 84 battery failure  
CR 15-03055, Siren 49 communications failure  
CR 15-04808, Siren 35 battery failure  
CR 15-05826, During Quarterly Growl Test, 39 sirens indicated battery failure  
CR 15-06676, Trend, increase power drain on sirens since the analog to digital conversion  
CR 15-06976, Siren 90 battery failure  
CR 16-00146, During Quarterly Growl Test, 5 sirens indicated battery failure  
CR 16-00616, Siren 20 battery failure  
CR 16-00702, ANS downward trend  
CR 16-03426, Siren 8 communications failure  
CR 16-04300, Siren 100 communications failure  
CR 16-04913, Siren 42 antenna sweep results below acceptable threshold  
CR 16-04966, Annual Siren Maintenance data sheet incomplete

#### **Section 1EP3: Emergency Response Organization Staffing and Augmentation System**

##### Procedures

EP-100, V.C. Summer Radiation Emergency Plan, Rev. 67  
EPP-105, Conduct of Drills and Exercises, Rev. 11, Change Letter D  
SAP-0127, Emergency Preparedness, Rev. 4, Change Letter C

SAP-0999, Corrective Action Program, Rev. 13, Change C  
 VCS-TQP-0605, Emergency Response Organization Training, Rev. 1  
 VCS-TQP-0917, Emergency Preparedness Training Program, Rev. 0

#### Records and Data

C-EPT-01, Emergency Response Organization Fundamentals  
 ERO Member Readiness and Response Expectations, Attachment VI, SAP-0127, Emergency Preparedness, Revs. 3 and 4, 2016  
 Off Hours ERONS Drill Reports, 4<sup>th</sup> Quarter 2014 to 2<sup>nd</sup> Quarter 2016  
 Various EP staff and ERO member training records

#### CAP Documents

CR-15-01488, 03/19/15 Afterhours ERONS Drill results  
 CR-15-02385, 05/19/15 Afterhours ERONS Drill results  
 CR-15-03477, 07/23/15 Afterhours ERONS Drill results  
 CR-15-06904, 12/15/15 Afterhours ERONS Drill results  
 CR-16-01377, 03/14/16 Afterhours ERONS Drill results  
 CR-16-03054, 06/13/16 Afterhours ERONS Drill results  
 CR-16-03636, 07/12/16 Afterhours ERONS Drill results  
 QA-AUD-2015-04, Station Emergency Plan, 04/22/15  
 QA-AUD 2016-04 Emergency Plan Audit, 02/14/16

### **Section 1EP4: Emergency Action Level and Emergency Plan Changes**

#### Procedures

EP-100, V.C. Summer Radiation Emergency Plan, Revs. 66 and 67  
 EPP-001, Activation and Implementation of Emergency Plan, Rev. 31  
 EPP-005, Offsite Dose Calculation, Rev. 21, Change Letter B  
 SAP-0127, Emergency Preparedness, Rev. 4, Change Letter C  
 VC1-EPAP-0108, Emergency Action Level Reference Manual – Unit 1, Rev. 0  
 VC1-EPP-0108, Emergency Action Level Technical Basis Document – Unit 1, Rev. 0  
 VCS-EPP-001.3, Site Area Emergency, Rev. 0  
 VCS-EPP-001.4, General Emergency, Rev. 0  
 VCS-EPP-002, Communication and Notification, Rev. 1

#### Records and Data

10 CFR 50.54(q) Screen and Evaluation for EPP-001.4, Rev. 9, Change B, Dated 03/23/16  
 10 CFR 50.54(q) Screen and Evaluation for EPP-002, Rev. 37, Change B, Dated 07/21/16  
 10 CFR 50.54(q) Screen and Evaluation for EPP-005, Rev. 21, Change A, Dated 02/17/15  
 10 CFR 50.54(q) Screen and Evaluation for EPP-005, Rev. 21, Change B, Dated 07/26/16  
 10 CFR 50.54(q) Screen and Evaluation for VCS-EPP-001.3, Rev. 1, Dated 07/21/16  
 10 CFR 50.54(q) Screen and Evaluation for VCS-EPP-001.4, Rev. 1, Dated 07/21/16  
 10 CFR 50.54(q) Screen and Evaluation for VCS-EPP-002, Rev. 1, Dated 08/23/16  
 10 CFR 50.54(q) Screen for EP-100, Rev. 67, Dated 06/16/16  
 10 CFR 50.54(q) Screen for Radiation Emergency Plan EP-100, Rev. 66, Dated 03/08/16



CAP Documents

CR-16-02190, The U1 Emergency Radiation Plan has two statements that conflict with the U1 QAPD

CR 16-03673, Programmatic weakness in completing 10 CFR 50.54(q) Screen and Evaluation

CR 16-04976, 10 CFR 50.54(q) Screen and Evaluation did not clearly represent all changes for VCS-EPP-001.3 and for VCS-EPP-001.4

**Section 1EP5: Maintenance of Emergency Preparedness**Procedures

EP-100, V.C. Summer Radiation Emergency Plan, Rev. 67

EPP-001, Activation and Implementation of Emergency Plan, Rev. 31

EPP-103, Emergency Equipment Checklist, Rev. 10, Change Letter F

EPP-0012, Emergency Plan Procedure, Onsite Personnel Accountability and Evacuation, Rev. 13

SAP-0999, Corrective Action Program, Rev. 13, Change C

SAP-0999C, Management Review Team (MRT), Rev. 1

SAP-0999D, Resolution of Quality Assurance Issues, Rev. 1

SAP-1350, V.C. Summer Nuclear Station Assessment Program, Rev. 9

SAP-1350A, Self-Assessment Review Board, Rev. 3

SAP-1350C, Nuclear Safety Culture Monitoring, Rev. 5

SAP-1358, Performance Improvement Process, Rev. 3A

VC1-EPP-0108, Emergency Action Level Technical Basis Document-Unit 1, Rev. 0

Records and Data

2015 Population Update Analysis, V.C. Summer-Expanded EPZ Boundary, KLD Engineering, P.C. KLD TR-746, April 2015

2015 Population Update Analysis, V.C. Summer-Expanded EPZ Boundary, KLD Engineering, P.C. KLD TR-831, April 2016

2015 and 2016 Memorandums of Understanding (MOUs) and Letters of Agreements (LOAs)  
Field Team Equipment Checklist (Inventory), Location: NND-Environmental, PMTS:  
1607152-001, Dated 09/09/16

ORG-01, Organization Performance Guidelines, Rev. 1, Dated 07/2016

RMG0019A, Calibration records, Dated 02/15/16

QA Audit Report QA-AUD-201504, Dated 04/22/15

Self-Assessment SA15-EP-02, EP Exercise and NRC Readiness, Dated 05/18/15

Self-Assessment SA16-EP-01, INPO Emergency Management Evaluation Readiness,  
Dated 01/25/16

Self-Assessment SA16-EP-02, EP Exercise and NRC Readiness, Dated 06/20/16

SRPD Calibration and Leak Test, VCS-HPP-0509, Rev. 0, Attachment I Equivalent,  
July 27, 2016

VCS-EPP-002, Attachment I, Rev. 1, Emergency Notification Form (ENF) for 09/28/16 DEP drill  
Work Order Step: 1508034-001, EQ ID: RMG0019A Calibration records

CAP Documents

CR 14-00638, Declared Unusual Event due to HU1.1 from Earthquake felt in Control Room and verification with USGS

CR 14-00655, During notification of state and counties of the Unusual Event declared on 02/14/14 at 2245 (CR-14-00638), Richland County Warning Point answered the initial call but hung up prior to the message being transmitted

CR 15-01303, The ESSX Line for Fairfield County Warning Point is not working.

CR 15-01589, Multiple document discrepancies identified in EOF

CR 15-01591, Failure to drill on Post Recovery and Re-entry per 8 year frequency

CR 15-02468, This CR is to track and trend the technical issue identified in the WebEOC EN Form

CR 15-02539, An Unusual Event was declared at 0525 on 06/07/15 due to HU4.1

CR 15-02541, Unauthorized person within the boundary of the OCA

CR 15-03533, NRC Public Exposure Cornerstone pre-exit meeting held on 7/30/2015

CR 15-04233, STS noted on dayshift that the EMnet emergency communications phone located in the Control Room was indicating no communication with the State Warning Point, Lexington County, Richland County, and Newberry County

CR 15-04449, This CR captures "Risk Significant Planning Standard" items identified in the 09/22/15 NRC Evaluated Exercise, with B-ERO Team and C-Operations Crew

CR 15-06178, Control Room Portable Satellite System: NEI 12-01

CR 16-00210, EMnet malfunction discovered this afternoon, preventing communication with offsite response organizations

CR 16-02012, Issue identified during QA-AUD-201604. EP-100 Radiation Emergency Plan, Rev. 65, Section K: Radiological Exposure Guidelines

CR 16-02013, Identified during QA-AUD-201604, Emergency Plan Audit. EP-100 Radiation Emergency Plan, Rev. 65, review

CR 16-02190, The U1 Emergency Radiation Plan (EP-100 Rev. 66), Part 2, Section 9 has two statements that conflict with the U1 QAPD (Rev. 3) or QSP-106 (Rev. 20)

CR 16-01029, This CR is to document Self-Assessment SA16-EP-01 Emergency Management Evaluation Readiness

CR 16-03672, This CR serves to document self-assessment SA16-EP-02

CR 16-04942, During EP inspection, NRC identified a discrepancy with Environmental Field monitoring kit #3, box #1. GM survey instrument (model E-530, serial #958) was found with no batteries in it. Loose batteries in the box. The instrument tested operable when batteries were placed into the instrument

CR 16-04951, During EP inspection, NRC identified that several position binders in the EOF had excerpts that were out of revision

## **Section 2RS1: Radiological Hazard Assessment and Exposure Controls**

### **Procedures, Guidance Documents and Manuals**

HPP-0401.003, Performing RWP Pre Job Briefings, Rev. 2, Change A

HPP-0403, Radiological Controls for Nuclear Work Activities, Rev. 13

SAP-0999, Corrective Action Program, Rev. 13, Change C

VCS-HPP-0649, Calibration and Operation of the SAM Tool Monitor, Rev. 0, Change A

VCS-HPP-0151, Use of the Radiation Work Permit, Rev. 0

VCS-HPP-0155, Control of Airborne Radiation Exposure (DAC-Hrs), Rev. 0

VCS-HPP-0157, Personnel Monitoring for Contamination, Rev. 0

VCS-HPP-0158.001, Radioactive Material Control, Rev. 0, Change B

VCS-HPP-0158.002, Release of Equipment and Material, 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 Areas and Very High Radiation Areas, Rev. 0, Change B  
 VCS-HPP-0160.003, Health Physics Key Control, Rev. 0, Change A  
 VCS-HPP-0303, Airborne Activity Sampling Techniques, Rev. 0  
 VCS-HPP-0410, Health Physics Routine Surveys, Rev. 0  
 VCS-HPP-0413, Diving Operations, Rev. 0  
 VCS-HPP-0405, Personnel Decontamination and Skin Dose Calculation, Rev. 0

#### Records and Data

HRA, LHRA and VHRA Postings and Barricades Survey # 04535, 7/13/16  
 NSTS Annual Inventory Reconciliation Confirmation, 1/5/16  
 Physical Inventory of Spent Fuel Pool, November 2015  
 Radiological Survey No. VCS1-M-20160203-14, RB 436' Change Out of RMG-1 Instrumentation, 2/3/16  
 Radiological Survey No. VCS1-M-20160211-9, AB26-02W SLAB, 2/11/16  
 Radiological Survey No. VCS1-M-20160308-16, FHB 436-01W 01 01E, 3/8/16  
 Radiological Survey No. VCS1-M-20160315-9, FHB 463' Move HI-TRAC to Cask Loading Pit (Dry Run #4), 3/15/16  
 Radiological Survey No. VCS1-M-20160325-5, Daily Routine Survey of 463' FHB for Dry Cask Support, 3/25/16  
 Radiological Survey No. VCS1-M-20160327-1, ISFSI Fenceline, 3/27/16  
 Radiological Survey No. VCS1-M-20160328-12, MicroReMicro REM Survey of the ISFSI Pad, 3/28/16  
 Radiological Survey No. VCS1-M-20160328-17, AB-00-01 / AB-00-01W, 3/28/16  
 Radiological Survey No. VCS1-M-20160328-24, Follow Up Dose Rate Alarm AB-00-01, 3/28/16  
 Radiological Survey No. VCS1-M-20160418-1, Daily Routine Survey of 463' FHB for Dry Cask Support, 4/18/16  
 Radiological Survey No. VCS1-M-20160419-25, Daily Routine Survey of 463' FHB for Dry Cask Support, 4/19/16  
 Radiological Survey No. VCS1-M-20160510-4, AB 426-02 WEST SLAB, 5/10/16  
 Radiological Survey No. VCS1-M-20160608-17, AB 412-01PA Quarterly Survey, 6/8/16  
 Radiological Survey No. VCS1-M-20160309-11, AB 412-01PA Quarterly Survey / ITF4702A Calibration, 3/9/16  
 RWP 15-04200, Refueling Activities RF-22, Rev. 0  
 RWP 16-00009, Operations (Routine Maintenance), Rev. 0  
 RWP 16-01301, Dry Cask Storage & Associated Work Activities, Rev. 1 and Rev. 4  
 RWP 16-02300, RB Power Entry Activities, Rev. 0  
 Sealed Source Inventory, 6/6/16  
 VCS-HPP-0303, Attachment II, Air Sample Results, FHB 463', 2/12/16 and 3/15/16  
 VCS-HPP-0303, Attachment II, Air Sample Results, Job Coverage for ISFSI Campaign – Loading Fuel in MPC, FHB 463', 4/19/16  
 VCS-HPP-0303, Attachment II, Air Sample Results, Job Coverage for ISFSI Campaign – MPC Closure Weld, FHB 463', 3/25/16  
 VCS-HPP-0303, Attachment II, Air Sample Results, RB 412' Sump Flange Removal, 11/18/15  
 VCS-HPP-0303, Attachment II, Air Sample Results, RB 436' Escape Hatch / Seal Table, 2/3/16  
 VCS-HPP-0303, Attachment II, Air Sample Results, RB RMG-14, 3/8/14  
 VCS-HPP-0303, Attachment II, Air Sample Results, Rx Cavity (Cavity Routine), 10/9/15

Calculation, Estimated RM-14 Frisker w/ HP210 Probe Response for PCR#15-001 DRP, 1/14/2016

Gamma Spec Analysis, 50K Particle on Workers Cheek Count #2, 11/8/2015

Survey # 15-11-11, Tools on Refuel Table, 11/08/2015

Varskin 4 Skin Dose Calculation, PCR 15-001 HPID 15518, 11/15/2015

VCS-HPP-0405, Attachment I, Personnel Contamination Report, PCR # 15-0001, for HPID 15518, 11/17/2015

VCS-HPP-0405, Attachment III, Investigation for Cause of Personnel Contamination, PCR # 15-0001, HPID 15518, CR-15-05758, 11/11/2015

VCS-HPP-0405, Attachment III, Investigation for Cause of Personnel Contamination, PCR # 15-0001, HPID 15518, CR-15-05758, 11/17/2015

Whole Body Counting Analysis, HPID 15518, 11/8/2015

#### CAP Documents

CR-15-04803

CR-15-04926

CR-15-05335

CR-15-05529

CR-15-05640

CR-15-05955

CR-16-01188

CR-16-01528

CR-16-01863

CR-16-02805

South Carolina Electric & Gas Company Quality Assurance Audit, Station Radiation Control, 7/7/16

#### **Section 2RS6: Liquid and Gaseous Effluents**

##### Procedures, Guidance Documents, and Manuals

Annual Radioactive Effluent Release Reports for 2015

HPP-0709 Sampling and Release of Radioactive Gaseous Effluents, Rev. 13

HPP-0710 Sampling and Release of Radioactive Liquid Effluents, Rev. 13

HPP-0835 – Effluent Permit Processing with RADEAS Software, Rev. 0

HPP-0904 Use of the Radiation Monitoring System (RMS), Rev. 13

Offsite Dose Calculation Manual, Rev. 30

SAP-0999, Corrective Action Program, Rev. 13, Change C

##### Records and Data Reviewed

Gaseous Waste Release Permit Number MPV-16-34, 06/28/16

Gaseous Waste Release Permit Number CP-16-01, 04/28/16

Liquid Waste Release Permit Number WM-16-63, 06/30/16

Liquid Waste Release Permit Number TB-16-26, 06/23/16

Liquid Waste Release Permit Number WM-16-68, 07/21/16

Results of Radiochemistry Cross Check Program -VC Summer, Q3 2015, Q1 2016

SAP- 205, Attachment 1, Removal and Restoration Checklist, of Out of Service Effluent Radiation Monitors for 2015 to July 2016

Virgil C. Summer, Radiation Monitor System Health Report, 2015

WO Step: 1601227-001, AB Exhaust HEPA & HECA Test, 06/09/16

WO Step: 1309216-001, LOOP Calibration – RMA0014, 08/26/13  
 WO Step: 1315500-001, LOOP Calibration – RMA0014, 04/06/15  
 WO Step: 1507556-001, LOOP Calibration – RMA0009, 01/26/16  
 WO Step: 1312532-001, LOOP Calibration – RML0009, 10/02/15  
 WO Step: 1500179-001, LOOP Calibration – RML0009, 04/04/15  
 WO Step: 1312531-001, LOOP Calibration – RML0005, 10/22/13  
 WO Step: 1500178-001, LOOP Calibration – RML0005, 04/22/15  
 WO Step: 1314070-001, LOOP Calibration – RMA0003, 02/05/14  
 WO Step: 1502672-001, LOOP Calibration – RMA0003, 08/26/15

#### Corrective Action Program (CAP) Documents

CR-15-03192  
 CR-15-04509  
 CR-15-03375  
 CR-15-05432  
 CR-15-05809  
 CR-16-02041  
 CR-16-02606  
 CR-16-02611

#### **Section 2RS7: Radiological Environmental Monitoring Program (REMP)**

##### Procedures, Guidance Documents, and Manuals

HPP-1022-E, Environmental Sampling and Analytical Requirements, Revision 6  
 HPP-1060-A, Meteorological Data Checks, Verification and Correction, Revision 5  
 HPP-1051, Environmental Air Sampler Calibration and Maintenance, Revision 5  
 HPP-1052, Setup, Operation, and Maintenance of the ISCO 3700 and 3710 Portable Water Sampler, Revision 3  
 VCS-HPP-1020, Environmental Sample Collection, Revision 0  
 ICP-300.060 A: Meteorological Bi-Weekly Data Verification, Revision 3

##### Records and Data

WO 1601108-001, ICP0300.060 EA: Functional Test On-line Data Retrieval and Verification, 06/13/2016  
 WO 1600405-001, ICP0300.060 EA: Functional Test On-line Data Retrieval and Verification, 05/31/2016  
 WO 1514569-001, ICP0300.060 EA: Functional Test On-line Data Retrieval and Verification, 05/02/2016  
 WO 1515089-001, ICP0300.060 EA: Functional Test On-line Data Retrieval and Verification, 05/16/2016  
 WO 1514437-001, STP0393.005A EA: Met Site Inst. Channel A Calibration, 02/23//2016  
 HPP-1051 Attachment 1: Fixed Non-digital Environmental Air Sampler Calibration Record: Site 17, 04/29/15  
 HPP-1051 Attachment 1: Fixed Non-digital Environmental Air Sampler Calibration Record: Site 7, 02/11/15  
 HPP-1051 Attachment IV: Fixed Digital Environmental Air Sampler Calibration Record: Site 30, Site 2, Site 7, 03/18/15  
 HPP-1051 Attachment IV: Fixed Digital Environmental Air Sampler Calibration Record: Site 17, Site 8, Site 6, 01/27/16

HPP-1051 Attachment IV: Fixed Digital Environmental Air Sampler Calibration Record: Site 17, 05/18/16  
 HPP-1051 Attachment IV: Fixed Digital Environmental Air Sampler Calibration Record: Site 6, Site 8, 06/15/16  
 VCS-HPP-1020 Attachment III: Digital Air Flow Sample Collection/Volume Determination Log: Week 29, 07/20/2016  
 VCS-HPP-1020 Attachment II: Digital Air Flow Sample Collection/Volume Determination Log: Week 29, 07/20/2016  
 Results of Environmental Cross Check Program, 1<sup>st</sup> Quarter 2016  
 Results of Environmental Cross Check Program, 3<sup>rd</sup> Quarter 2015  
 VC Summer Annual Radiological Environmental Operating Report 2015  
 50.75g Report: Post Fukushima Surface Soil Samples, 07/31/2013  
 50.75g Report, CR11-03667, 10/17/2011

#### CAP Documents and Assessments

NEI 07-07 Ground Water Protection Initiative Peer Assessment Report 08/08/2015  
 CR 16-02187  
 CR 16-02490  
 CR-16-00328  
 CR-16-02116  
 CR-15-04587  
 CR-15-05277  
 CR-15-01440

#### **Section 2RS8: Radioactive Material Processing and Transportation**

##### Procedures and Guidance Documents

PCP-001, Process Control Program for Solid Radioactive Waste, Rev. 12  
 S SAP-0999, Corrective Action Program, Rev. 13, Change C  
 OP-108, Liquid Waste Processing System, Rev. 24  
 SOP-111, Solid Waste Disposal System, Rev. 10  
 VCS-HPP-0702, Receipt of Radioactive Material, Rev. 1, Change A  
 VCS-HPP-0703, Shipping Radioactive Material, Rev. 1, Change A

##### Shipping Records and Radwaste Data

2015 Annual Radioactive Effluent Release Report  
 2015 - 2016 DAW 10 CFR 61 Analysis  
 Radioactive Shipment Log, 07/08/15 – 07/19/16  
 Receipt of Radioactive Materials Form, Shipment Data: 2 Empty Rad Sealands – 1 B-25 Clean Lead Blankets, Shipment No. 15-RM-120, Attachment I, VCS-HPP-0702, Receipt of Radioactive Material, Rev. 1, Change A, Dated 10/29/15  
 Shipment No. 15-027, SCO, RCP Motor Stator/Metal Waste  
 Shipment No. 15-071, Type A, Excore Dosimetry Box  
 Shipment No. 16-004, LSA-II, Dewatered Bead/Charcoal Resin  
 Shipment No. 16-025, LQ, Load Cell

CAP Documents

CR 15-02937

CR-15-03352

CR-15-03566

CR-16-00424

CR-16-00849

CR-16-01005

Assessment No. and Title: SA16-HP-01-Radwaste, 07/08/16

**Section 40A1: Performance Indicator Verification**

**Emergency Preparedness**

Procedures

EP-100, V.C. Summer Radiation Emergency Plan, Rev. 67

EPP-106, Emergency Preparedness Performance Indicator Procedure, Rev. 3, Change Letter C

SAP-1360, NRC and INPO/WANO Performance Indicators, Rev. 3

Records and Data

Drill and Exercise Participation records of ERO personnel for 3<sup>rd</sup> Quarter 2015 through 2<sup>nd</sup> Quarter 2016

Drill and Exercise Performance opportunities documentation from 3<sup>rd</sup> Quarter 2015 through 2<sup>nd</sup> Quarter 2016

ED Dose and Dose Rate Alarm Summary Report, October 2015 – June 2016

HPP-0242, Enclosure A, Performance Indicator Data Collection, Validation, & Calculation Guidelines, October 2015 – June 2016

Performance Indicator Data, Emergency Preparedness, Attachment VII, SAP-1360, NRC and INPO/WANO Performance Indicators, Rev. 3, July 2015 to June 2016

Siren Test results from 3<sup>rd</sup> Quarter 2015 through 2<sup>nd</sup> Quarter 2016

Various ERO Personnel Qualification and Participation records

CAP Documents

CR 14-05415, A DEP opportunity identified on PMTS #1405213 during the ERO Tabletop on 10/07/14 will not be counted as an Opportunity.

CR 14-05949, Failed opportunity during a Drill/Exercise Performance (DEP) scenario. The failure was a result of an inaccuracy on the ENF.

CR 15-02297, Siren 59 failed the Bi-weekly Silent Test

CR 15-02943, ANS Performance Indicator downward trend

CR 15-03560, Determine what barriers failed resulting in missed DEP opportunities during 2015 LOR Annual Requalification Examinations.

CR 15-03928, This CR captures "Risk Significant Planning Standard" items identified in the 08/19/15 B-ERO Training Drill with C-Ops.

CR 16-00995, This CR captures any "Risk Significant Planning Standard" (RSPS) related items identified in the 02/17/16 D-ERO Drill with D-Operations Crew, as deemed in 10CFR50.47.

CR 16-01267, This CR is to document that there was a missed Risk Significant Planning Standard (RSPS) during the first quarter ERO tabletops.

CR 16-01316, During the performance of observation QA-AUD-2016110050, QA noted signs listed in EPP-104 were missing.

CR 16-03965, To document that there was 1 DEP missed opportunity on 08/03/16.

**Radiological Hazard Assessment and Exposure Controls**

Records and Data Reviewed

Liquid Waste Release Permit Number WM-16-68, 07/21/16

Gaseous Waste Release Permit Number MPV-16-34, 06/28/16

HPP-0242, Reporting NRC Performance Indicators, Rev. 0

HPP-0242, Enclosure A, 2015-2016

SAP-1360, NRC and INPO/WANO Performance Indicators, Rev. 3

SAP-1360, Attachment VIII, Performance Indicator Data, Jan-May 2016

2015 Annual Radioactive Effluent Release Report

ED Dose and Dose Rate Alarm Summary Report, October 2015 – June 2016

HPP -0242, Enclosure A, Performance Indicator Data Collection, Validation, & Calculation  
Guidelines, October 2015 – June 2016