



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

October 27, 2017

Mr. Darin Myers
Vice President
Southern Nuclear Operating Company, Inc.
Vogtle Electric Generating Plant
7821 River Road
Waynesboro, GA 30830

**SUBJECT: VOGTLE ELECTRIC GENERATING PLANT – NUCLEAR REGULATORY
COMMISSION INTEGRATED INSPECTION REPORT 05000424/2017003 AND
05000425/2017003**

Dear Mr. Myers:

On September 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Vogtle Electric Generating Plant, Units 1 and 2. On October 19, 2017, the NRC inspectors discussed the results of this inspection with Daniel Komm (Plant Manager) and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

The NRC inspectors documented three findings of very low safety significance (Green) in this report, one NRC-identified and two self-revealing. All of these findings involved violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

Also, the inspectors documented two licensee-identified violations which were determined to be of very low safety significance, in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations 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 U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC resident inspector at the Vogtle Electric Generating Plant, Units 1 and 2.

If you disagree with any of the cross-cutting aspect assignments 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 U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC resident inspector at the Vogtle Electric Generating Plant, Units 1 and 2.

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/

Shane Sandal, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Docket Nos.: 50-424 and 50-425
License Nos.: NPF-68 and NPF-81

Enclosure:
IR 05000424/2017003; 05000425/2017003
w/Attachment: Supplemental Information

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SUBJECT: VOGTLE ELECTRIC GENERATING PLANT – NUCLEAR REGULATORY
 COMMISSION INTEGRATED INSPECTION REPORT 05000424/2017003 AND
 05000425/2017003 October 27, 2017

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OFFICE	RII/DRP	RII/DRP	RII/DRP	RII/DRP	RII/DRP	RII/DRS	RII/DRS
NAME	M. Endress	A. Alen	D. Retterer	D. Mas-Penaranda	S. Sandal	R. Williams	S. Downey
DATE	10/23/2017	10/23/2017	10/23/2017	10/26/2017	10/27/2017	10/23/2017	10/23/2017
OFFICE	RII/DRS	RII/DRS	RII/DRS				
NAME	W. Pursley	A. Nielsen	B. Collins				
DATE	10/23/2017	10/23/2017	10/23/2017				

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-424, 50-425

License Nos.: NPF-68, NPF-81

Report No.: 05000424/2017003; and 05000425/2017003

Licensee: Southern Nuclear Operating Company, Inc.

Facility: Vogtle Electric Generating Plant, Units 1 and 2

Location: Waynesboro, GA 30830

Dates: July 1, 2017 through September 30, 2017

Inspectors: M. Endress, Senior Resident Inspector
A. Alen, Resident Inspector
D. Retterer, Resident Inspector
R. Williams, Senior Reactor Inspector (1R07)
S. Downey, Senior Reactor Inspector (1R07)
B. Collins, Reactor Inspector (1R08)
W. Pursley, Health Physics Inspector (2RS1, 4OA7)
A. Nielsen, Senior Health Physics Inspector (2RS1, 2RS8, 4OA7)

Approved by: Shane Sandal, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000424/2017003; and 05000425/2017003, 07/01/2017, through 09/30/2017; Vogtle Electric Generating Plant, Units 1 and 2; Surveillance Testing, Problem Identification and Resolution.

The report covered a three-month period of inspection by resident inspectors and regional inspectors. There is one NRC-identified violation, two self-revealing violations, and two licensee-identified violations documented in this report which were determined to be of very low safety significance. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP) dated April 29, 2015. The cross-cutting aspects are 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 November 1, 2016. The NRC's program for overseeing the safe operations of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6. Documents reviewed by the inspectors which are not identified in the Report Details are identified in the List of Documents Reviewed section of the Attachment.

NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. A Self-Revealing, Green, non-cited violation (NCV) of Technical Specifications (TS) 5.4.1.a, "Procedures," was identified for the licensee's failure to implement maintenance work instructions and establish appropriate procedures concerning the use of flow measurement and test equipment (M&TE) in support of essential safety features (ESF) chilled water pumps in-service testing (IST). As a result, the Unit 1 'A' train safety-related chiller was inadvertently rendered inoperable when technicians isolated a flow transmitter associated with the chiller's auto-start control logic when installing and removing M&TE in support of the IST. The licensee entered this issue into their corrective action program (CAP) under condition report (CR) 10390340 and corrective action report 270610 and planned to revise the procedure. Failure to implement maintenance work instructions and establish appropriate procedures concerning the use of flow M&TE in support of ESF chilled water pumps IST, which can affect ESF chiller performance, as required by Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements," of February 1978, was a performance deficiency (PD).

The performance deficiency was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was determined to be of very low safety significance (Green) because while the unit 1 'A' train ESF chiller was rendered inoperable, it did not represent a loss of function of the train for greater than its TS Allowed Outage Time. The finding was assigned a cross cutting aspect of "Challenge the Unknown" because questions and risks regarding the use of flow M&TE for the test were not properly evaluated and managed before proceeding. [H.11] (Section 1R22)

- Green. An NRC-Identified, Green, NCV of TS 5.4.1.a, "Procedures," was identified for the licensee's failure to maintain a Unit 2 surveillance procedure that demonstrated satisfactory performance of the forward flow safety function of emergency core cooling system (ECCS) check valves. The licensee revised and performed the test to verify satisfactory valve performance. This issue was entered into the licensee's CAP as CR10410794. The failure to maintain procedure 14721D-2 to ensure test conditions that adequately demonstrated satisfactory performance of ECCS check valves 2-1205-U6-001/002, as required by Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements," of February 1978, was a performance deficiency (PD).

The performance deficiency was more than minor because if left uncorrected, it could result in degradation of ECCS check valves to go undetected. The finding was associated with the mitigating system cornerstone. The finding was determined to be of very low safety significance (Green) because the performance deficiency did not result in a loss of operability or functionality of ECCS check valves. The finding was assigned a cross cutting aspect of "Resources", because the licensee did not ensure that an ECCS surveillance procedure was adequate to support nuclear safety. (H.1) (Section 1R22).

- Green. A Self-Revealing, Green, NCV of TS 5.4.1.a, "Procedures," was identified for the licensee's failure to perform an adequate cleanliness inspection of the Unit 2 nuclear service cooling water (NSCW) system pump no. 6 discharge motor-operated-valve (MOV) limit switch compartment, as required by the maintenance procedure. As result, the valve failed to operate when demanded and rendered the NSCW pump inoperable. The failure to perform an adequate cleanliness inspection of NSCW pump no. 6 discharge MOV limit switch compartment following preventive maintenance, as required by maintenance procedure NMP-ES-017-008, was a performance deficiency (PD). The licensee cleaned affected MOV sub-components, verified proper operation, and restored operability of the pump. This issue was entered into the licensee's CAP as CR10399054.

The performance deficiency was more than minor because it was associated with the Human Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). The finding was determined to be of very low safety significance (Green) because although the performance deficiency affected the qualification and operability of the NSCW pump, it did not represent a loss of function of an NSCW train for greater than its TS Allowed Outage Time. The finding was assigned a cross cutting aspect of "Avoid Complacency", because maintenance technicians did not recognize the possibility of making mistakes when performing routine tasks of inspecting and manipulating grease containing components inside the limit switch compartment. (H.12) (Section 4OA2).

Licensee-Identified Findings

Two violations of very low safety significance were identified by the licensee and has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into their corrective action program. These violations and corrective actions are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at or near full rated thermal power (RTP) for the entire inspection period.

Unit 2 began the report period at full RTP. On September 17, 2017, the unit was shut down for planned refueling outage 19 (2R19) and remained shut down for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope

Impending Adverse Weather Conditions: The inspectors reviewed the licensee's preparations to protect risk-significant systems from Hurricane Irma expected on September 11, 2017. The inspectors evaluated the licensee's implementation of adverse weather preparation procedures and compensatory measures, including operator staffing, before the onset of the adverse weather conditions. The inspectors reviewed the licensee's plans to address the ramifications of potentially lasting effects that may result from high wind, hail, and lightning. The inspectors verified that operator actions specified in the licensee's adverse weather procedure maintain readiness of essential systems. The inspectors verified that required surveillances were current, or were scheduled and completed, if practical, before the onset of anticipated adverse weather conditions. The inspectors also verified that the licensee implemented periodic equipment walkdowns or other measures to ensure that the condition of plant equipment met operability requirements.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

Partial Walkdown: The inspectors verified that critical portions of the following four systems were correctly aligned by performing partial walkdowns. The inspectors determined the correct system lineup by reviewing plant procedures and drawings.

- Unit 1, 'A' train ESF chiller with the 'B' train ESF chiller out of service (OOS) due to emergent issue.
- Unit 2, 'A' train nuclear service cooling water (NSCW) due to 'B' train OOS due to emergent issues.

- Unit 2, 'A' train motor-driven auxiliary feed water (MDAFW) and 'C' train turbine-driven auxiliary feed water (TDAFW) systems with 'B' train MDAFW pump OOS due to extended preventative maintenance (PM).
- Unit 1 and Unit 2 electrical lineup with 1A and 2B Reserve Auxiliary Transformer (RAT) OOS for testing and maintenance.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05AQ)

a. Inspection Scope

Quarterly Inspection: The inspectors evaluated the adequacy of fire plans by comparing the fire plans to the defined hazards and defense-in-depth features specified in the fire protection program for the following five fire areas.

- Unit 2, 'A' train emergency diesel generator (EDG) building and electrical tunnel to the control building, fire zones 143, 161 and 163.
- Unit 1, Control Building Level "A", 4.16kV switchgear and remote shutdown rooms, fire zones 91, 92, 97, 98, and 103
- Unit 1, Auxiliary Building level "D", containment spray and residual heat removal (RHR) pump rooms, fire zones 14B, 19, 20, and 21
- Unit 2, Auxiliary Building level "B", ACCW pump, safety injection (SI) pump, and pipe penetration rooms, fire zones 26B, 30, 31, 32, 33
- Unit 1, Control Building level "3", ESF chiller and normal A/C rooms, fire zones 125A, 126A, 135, 153, 178, 179, 180

The inspectors assessed the following:

- control of transient combustibles and ignition sources
- fire detection systems
- water-based fire suppression systems
- gaseous fire suppression systems
- manual firefighting equipment and capability
- passive fire protection features
- compensatory measures and fire watches
- issues related to fire protection contained in the licensee's corrective action program
- material condition and operational status of fire protection equipment

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

Internal Flooding: The inspectors reviewed related flood analysis documents and walked down the areas listed below containing risk-significant structures, systems, and components susceptible to flooding. The inspectors verified that plant design features and plant procedures for flood mitigation were consistent with design requirements and internal flooding analysis assumptions. The inspectors also assessed the condition of flood protection barriers and drain systems. In addition, the inspectors verified the licensee was identifying and properly addressing issues using the corrective action program.

- Unit 1, component cooling water heat exchanger rooms (Auxiliary Building rooms R202 and R203)

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

Annual Review

The inspectors verified the readiness and availability of the Unit 2 'B' train safety injection pump lube oil and motor cooler heat exchangers to perform their design functions by verifying the licensee followed periodic maintenance methods outlined in the plant's specific commitments to Generic Letter 89-13, reviewing performance test results, and observing inspection and state of cleanliness of the heat exchangers. Additionally, the inspectors verified that the licensee had entered any significant heat exchanger performance problems into the corrective action program and that the licensee's corrective actions were appropriate.

Triennial Review

The inspectors conducted an onsite review of the implementation of the licensee's heat exchanger and heat sink performance program. The scope of this review included heat exchangers and heat sinks required to remove decay heat and provide cooling water for risk significant or safety-related equipment.

The inspectors reviewed the safety injection pump lube oil cooler, the essential chiller condenser, and the residual heat removal pump motor cooler heat exchangers which were directly cooled by the service water system. The inspectors reviewed operability determinations, completed surveillances, vendor manual information, associated calculations, performance test results, and inspection results. This information was used to determine if the condition and operation of the heat exchangers was consistent with design assumptions in heat transfer calculations and as described in the final safety analysis report.

For those heat exchangers directly cooled by the service water system, the inspectors additionally determined if testing, inspection, maintenance, and monitoring of biotic fouling and macro fouling programs were adequate to ensure proper heat transfer. The inspectors reviewed the methods and results of heat exchanger performance inspections and cleanings to determine if the as-found results were recorded, evaluated, and appropriately dispositioned so that the as-left condition was acceptable. The inspectors also evaluated the test results to determine if the frequency was sufficient enough to detect performance degradation.

The inspectors determined if performance of the nuclear service cooling water system (NSCW), and its subcomponents such as piping, intake screens, pumps, valves, etc., was appropriately evaluated by tests or other equivalent methods, to ensure availability and accessibility to the onsite cooling water systems. Specifically, the inspectors:

- performed a system walkdown of the NSCW to determine if the licensee's inspections were comprehensive and of significant depth to ensure sufficient reservoir capacity, heat transfer capability, and structural integrity
- reviewed the licensee's operation of the service water system and the NSCW to determine if key design requirements were considered as inputs and maintained
- reviewed the licensee's performance testing of the service water system and the NSCW to determine if the licensee ensured adequate isolation during design basis events, consistency between testing methodologies and design basis leakage rate assumptions, and proper performance of risk significant non-safety related functions
- performed a system walkdown and reviewed documentation on the service water and closed cooling water systems to determine if the licensee's assessment on structural integrity was adequate

The inspectors also reviewed condition reports related to heat exchanger and heat sink performance issues to determine if the licensee had an appropriate threshold for identifying issues and to evaluate the effectiveness of the corrective actions. The documents that were reviewed are included in the Attachment to this report. These inspection activities constituted four heat sink inspection samples as defined in IP 71111.07-05.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (71111.08)

a. Inspection Scope

Non-Destructive Examination Activities and Welding Activities

From September 25 – 29, 2017, the inspectors conducted an onsite review of the implementation of the licensee's inservice inspection (ISI) program for Unit 2. The ISI program is designed to monitor degradation of pressure retaining components in vital system boundaries.

The scope of this program includes components within the reactor coolant system boundary, risk-significant piping boundaries, and containment system boundaries.

The inspectors either directly observed or reviewed the following non-destructive examination (NDE) activities. These activities were mandated by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code of Record: 2007 Edition with 2008 Addenda for NDE; 2001 Edition with 2003 Addenda for welding). The inspectors evaluated the NDE activities for compliance with the requirements in Section XI and Section V of the ASME Code. The inspectors also evaluated if any identified indications or defects were dispositioned in accordance with either the ASME Code or an NRC-approved alternative requirement. Additionally, the inspectors reviewed the qualifications of the NDE technicians performing the examinations to determine if they were in compliance with ASME Code requirements.

- Ultrasonic Testing (UT) examination of ISI-21201-V6-001-W34/-W35/-W38/-W39, 32.5" OD, ASME Class 1, Reactor Coolant system, loops 1-4 reactor pressure vessel inlet safe end-to-nozzle welds (observed)
- Liquid Penetrant Testing (PT) of 879053W2, 0.75" OD, ASME Class 2, pipe cap on steam generator #2 narrow range level transmitter line 21202B6002 (reviewed)
- Radiographic Testing (RT) of 21305155-6", 6.625" OD, ASME Class 2, feedwater system pipe-to-pipe weld (observed)

The inspectors reviewed the following welding activities and evaluated these activities for compliance with site procedures and the requirements in Section IX and Section XI of the ASME Code. Specifically, the inspectors reviewed the work orders, repair or replacement plans, weld data sheets, welding procedures, procedure qualification records, welder performance qualification records, and NDE reports.

- SNC795543, Replacement of Feedwater Line 2-1305-155-6", ASME Class 2, 6.625" OD, feedwater system pipe-to-pipe welds (reviewed)

The inspectors reviewed the listing of non-destructive surface and volumetric examinations performed during the previous refueling outage. The inspectors verified that the licensee did not identify any relevant indications that were analytically evaluated and accepted for continued service.

PWR Vessel Upper Head Penetration Inspection Activities

The inspectors performed the following activities to verify that the requirements of the ASME Code and applicable licensee procedures were being met for the Unit 2 reactor vessel upper head:

- Reviewed the effective degradation years and re-inspection years calculations to determine if a volumetric examination or bare metal visual examination of the penetration nozzles was required during the current outage.
- Observed/reviewed the final examination report for the bare metal visual examination of three upper head penetrations.

- Verified that the examinations were performed in accordance with the requirements of the ASME Code and that the frequency was consistent with ASME Code Case N-729-1.
- Observed/reviewed the results of the visual examination performed under the vessel head insulation.

The inspectors verified that the licensee did not identify any indications that were accepted for continued service. Additionally, the inspectors verified that the licensee did not perform any welding repairs to the upper head penetrations since the last Unit 2 refueling outage.

Boric Acid Corrosion Control Inspection Activities

The inspectors reviewed the licensee's boric acid corrosion control program (BACCP) activities to determine if they were implemented in accordance with program requirements, applicable regulatory requirements, and industry guidance. Specifically, the inspectors performed the following activities:

- Reviewed applicable procedures and the results of the licensee's most recent containment walkdown inspection.
- Interviewed the BACCP owner.
- Conducted an independent walkdown of accessible areas of the Unit 2 reactor building containment pipe chase.
- Verified that degraded or non-conforming conditions, such as boric acid leaks, were properly identified and corrected in accordance with the licensee's BACCP and the corrective action program (CAP).
- Reviewed engineering evaluations of components with boric acid leakage which verified that minimum wall thickness of those components was maintained.

Steam Generator Tube Inspection Activities

The inspectors reviewed the Unit 2 steam generator maintenance program. The inspectors verified that no steam generator tube inspection activities were required this refueling outage. This inspection schedule was verified with the requirements of the ASME Code, the licensee's Technical Specifications, and applicable industry guidance.

Identification and Resolution of Problems

The inspectors reviewed a sample of ISI-related issues entered into the corrective action program. The inspectors evaluated if the licensee had appropriately described the scope of the problem and had initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)

a. Inspection Scope

Resident Inspector Quarterly Review of Licensed Operator Requalification: The inspectors observed one evaluated simulator scenario, V-RQ-SE-17401, As-Found DEP Scenario, Ver. 1.0, and one training simulator scenario, V-RQ-SE-17404, Loss of Core Cooling, Ver. 1.0, administered to an operating crew, on August 14, 2017, conducted in accordance with the licensee's accredited requalification training program.

The inspectors assessed the following:

- licensed operator performance
- the ability of the licensee to administer the scenario and evaluate the operators
- the quality of the post-scenario critique
- simulator performance

Resident Inspector Quarterly Review of Licensed Operator Performance: The inspectors observed licensed operator performance in the main control room during a Unit 2 'A' train EDG monthly surveillance run on August 28, 2017 and again on September 17, 2017 during a Unit 2 shutdown and cooldown.

The inspectors assessed the following:

- use of plant procedures
- control board manipulations
- communications between crew members
- use and interpretation of instruments, indications, and alarms
- use of human error prevention techniques
- documentation of activities
- management and supervision

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors assessed the licensee's treatment of the issue listed below to verify the licensee appropriately addressed equipment problems within the scope of the maintenance rule (10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"). The inspectors reviewed procedures and records to evaluate the licensee's identification, assessment, and characterization of the problems as well as their corrective actions for returning the equipment to a satisfactory condition.

The inspectors also interviewed system engineers and the maintenance rule coordinator to assess the accuracy of performance deficiencies and extent of condition.

- Unit 2, 'A' train EDG heating, ventilation, and air conditioning (HVAC) fan failures, CR10377303

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

a. Inspection Scope

The inspectors reviewed the six maintenance activities listed below to verify that the licensee assessed and managed plant risk as required by 10 CFR 50.65(a)(4) and licensee procedures. The inspectors assessed the adequacy of the licensee's risk assessments and implementation of risk management actions. The inspectors also verified that the licensee was identifying and resolving problems with assessing and managing maintenance-related risk using the corrective action program. Additionally, for maintenance resulting from unforeseen situations, the inspectors assessed the effectiveness of the licensee's planning and control of emergent work activities.

- Unit 2, August 7, GREEN risk profile associated with 'B' train safety injection pump and room cooler being OOS for planned maintenance.
- Unit 2, August 9, GREEN risk profile and risk management actions (RMAs) associated with #2 NSCW pump being OOS for maintenance.
- Unit 2, August 14 -15, YELLOW risk profile and RMAs associated with 'B' train RHR system and room cooler being OOS for planned maintenance.
- Unit 2, August 16, RED risk profile and RMAs associated with emergent inoperability if 'B' train of NSCW system.
- Unit 2, August 21, GREEN risk profile associated with 2A RHR PM Outage with the #4 NSCW pump OOS for maintenance.
- Unit 1, September 18 -22, YELLOW risk profile and RMAs associated with 'A' train reserve auxiliary transformer (RAT) and alternating current (AC) offsite circuit no. 2 being OOS for planned maintenance.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

Operability Determinations and Functionality Assessments Review: The inspectors selected the six operability determinations or functionality evaluations listed below for review based on the risk-significance of the associated components and systems. The inspectors reviewed the technical adequacy of the determinations to ensure that

technical specification operability was properly justified and the components or systems remained capable of performing their design functions. To verify whether components or systems were operable, the inspectors compared the operability and design criteria in the appropriate sections of the technical specification and updated final safety analysis report to the licensee's evaluations. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. Additionally, the inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with operability evaluations.

- Unit 2, operability determination for steam leak on #2 steam generator inside of containment, CR10382074
- Unit 1, operability determination for containment cooler no. 5 due to its main control room hand-switch 'amber' light not illuminating during surveillance, CR10386816
- Unit 1, operability determinations for 'A' ESF chiller tripping during chilled water pump in-service testing, CR10390340
- Unit 2, operability determination for low cooling water flow on the 'B' safety injection pump lube oil cooler, CR10395806
- Unit 1 and 2, operability determination for no preventative maintenance performed on 1E electrical circuit lockout relays, CR10381797
- Units 1 and 2, operability determination of NSCW pump motors due to non-compliance of electrical power junction boxes with NEMA enclosure type 4, CR10404464

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

a. Inspection Scope

The inspectors reviewed CR10383826 for the equivalency determination for atmospheric relief valve (ARV) actuator hydraulic cylinder backup seal rings. The inspectors assessed the following:

- Verified that the modifications did not affect the safety functions of important safety systems.
- Confirmed the modifications did not degrade the design bases, licensing bases, and performance capability of risk significant structures, systems and components.
- Verified modifications performed during plant configurations involving increased risk did not place the plant in an unsafe condition.
- Evaluated whether system operability and availability, configuration control, post-installation test activities, and changes to documents, such as drawings, procedures, and operator training materials, complied with licensee standards and NRC requirements.
- Reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with modifications.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors either observed post-maintenance testing or reviewed the test results for the five maintenance activities listed below to verify the work performed was completed correctly and the test activities were adequate to verify system operability and functional capability.

- SNC881161, Unit 1, 'B' train ESF Chiller Nucana Lead/Lag (NLL) card replacement (Corrective Maintenance)
- SNC889694, Unit 2 'B' train NSCW pump no. 6 discharge motor-operated valve repair
- SNC630495, Unit 2, '2A' RHR pump system outage for clean and inspection
- SNC889742, Unit 2, NSCW pump #4 cable replacement
- SNC642736, Unit 2, 'B' SI pump motor and lube oil cooler heat exchanger clean and inspection

The inspectors evaluated these activities for the following:

- Acceptance criteria were clear and demonstrated operational readiness.
- Effects of testing on the plant were adequately addressed.
- Test instrumentation was appropriate.
- Tests were performed in accordance with approved procedures.
- Equipment was returned to its operational status following testing.
- Test documentation was properly evaluated.

Additionally, the inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with post-maintenance testing.

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

For the Unit 2 refueling outage (2R19), which started on September 17, 2017 through September 30, 2017, the inspectors evaluated the following outage activities:

- shutdown and cooldown
- reactor defueling and refueling operations
- reactor coolant system instrumentation and electrical power configuration
- reactivity and inventory control
- decay heat removal and spent fuel pool cooling system operation

The inspectors verified that the licensee:

- controlled plant configuration in accordance with administrative risk reduction methodologies
- developed work schedules to manage fatigue
- developed mitigation strategies for loss of key safety functions
- adhered to operating license and technical specification requirements

Inspectors verified that safety-related and risk-significant structures, systems, and components not accessible during power operations were maintained in an operable condition. The inspectors also reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with outage activities.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the seven surveillance tests listed below. The surveillance test was either observed directly or test results were reviewed to verify testing activities and results provide objective evidence that the affected equipment remain capable of performing their intended safety functions and maintain their operational readiness consistent with the facility's current licensing basis. The inspectors evaluated the test activities to assess for:

- preconditioning of equipment,
- appropriate acceptance criteria,
- calibration and appropriateness of measuring and test equipment,
- procedure adherence, and
- equipment alignment following completion of the surveillance.

Additionally, the inspectors reviewed a sample of significant surveillance testing problems documented in the licensee's corrective action program to verify the licensee was identifying and correcting any testing problems associated with surveillance testing.

Routine Surveillance Tests

- 14721D-2, Unit 2 ECCS Subsystem Flow Balance and Check Valve Refueling In-service Test, Ver. 3.2
- 14980B-2, Unit 2 Diesel Generator 2B Operability Test, Ver. 28
- 14460-2, Unit 2 'B' ESFAS Test, Ver. 36.1

In-Service Tests (IST)

- 14801B-2, Unit 2 'B' NSCW transfer pump IST, Ver. 10
- 14809A-1, Unit 1 '1A' ESF chiller pump IST, Ver. 5
- 14825-2, Unit 2 'A' RHR valve IST, Ver. 96.1

Containment Isolation Valve

- 14384-2, Unit 2 Containment Penetration No. 84 Containment Purge Exhaust Local Leak Rate Test, Ver. 12

b. Findings

b.1 Failure to Implement and Establish Appropriate Work Instructions Affecting Safety-Related Chiller

Introduction: A Green, self-revealing, NCV of TS 5.4.1.a, "Procedures," was identified for the licensee's failure to implement maintenance work instructions and establish appropriate procedures concerning the use of flow measurement and test equipment (M&TE) in support of essential safety features chilled water pumps in-service testing (IST). As a result, the Unit 1 'A' train (1A) safety-related chiller was inadvertently rendered inoperable when maintenance technicians isolated a flow transmitter associated with the chiller's auto-start control logic when installing and removing M&TE in support of 1A chilled water pump IST. Failure to implement maintenance work instructions and establish appropriate procedures concerning the use of flow M&TE in support of ESF chilled water pumps IST, which can affect ESF chiller performance, as required by Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements," of February 1978, was a performance deficiency (PD).

Description: On July 23, 2017, the licensee was conducting an IST on the 1A ESF chilled water pump in accordance with procedure 14908A-1, "Train 'A' ESF Chilled Water Pump Inservice Test," version 5. Following completion of the pump flow test, at approximately 0400, the chilled water pump and chiller were left running to support a control room emergency filtration system (CREFS) surveillance per procedure 14510A, "Train 'A' CREFS Operability Test," version 6.2. At 0428, control room operators received a "Condensate Water Low Flow" alarm (a chiller associated trouble alarm) and the 1A ESF chiller was found tripped. At approximately 0436, the chiller automatically re-started. Operators secured all test activities and declared the 1A ESF chiller inoperable due to its unexpected and abnormal operation.

Licensee troubleshooting determined that maintenance technicians isolated flow transmitter (FT), FT-22425, to remove M&TE while the chiller was running.

This FT was part of the ESF chiller control circuit logic, which prevents chiller operation without adequate flow on the chilled water condensate loop. Isolation of the FT generated a low chilled water flow signal to the chiller control circuit, which in turn tripped the chiller; preventing manual or automatic operation.

The inspectors reviewed surveillance procedures 14908A/B-1/2, 'A' and 'B' trains IST procedures for both Unit 1 and Unit 2, and determined they did not establish appropriate instructions or cautions when using M&TE at FT-22425 instrument taps. Specifically, the procedure allowed use of M&TE at the FT instrument taps; however, it did not caution nor instructed operators to declare the ESF chiller inoperable and enter associated TS Limiting Condition of Operation (LCO) Action statement when isolating the FT during M&TE installation and removal. Also, the inspectors noted that special instructions in work order SNC634389, which drove the performance of the 14809A-1 surveillance, directed M&TE to be installed at suction and discharge pressure instrumentation only. It did not direct workers to install flow M&TE. According to personal statements following the event, there were questions to whether or not M&TE was needed for flow measurements since the test was a 'Comprehensive Pump Flow Test,' which normally required more accurate instrumentation. Following discussion with control room operators the decision was made to install M&TE across FT-22425, which then rendered the chiller inoperable during installation and again later during removal. The licensee entered this issue into their corrective action program as condition report (CR) 10390340 and corrective action report (CAR) 270610 and planned to revise the procedure.

Analysis: Failure to implement maintenance work instructions and establish appropriate procedures concerning the use of flow M&TE in support of ESF chilled water pumps IST, which can affect ESF chiller performance, as required by Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements," of February 1978, was a performance deficiency. The PD was more than minor because it was associated with the Equipment Performance attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the PD affected the reliability of the 1A ESF chiller. The finding was evaluated using of Exhibit 2, "Mitigating Systems Screening Questions," of IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued June 19, 2012. The finding was of very low safety significance (i.e. Green) because while the unit 1 'A' train ESF chiller was rendered inoperable it did not represent a loss of function of the train for greater than its TS Allowed Outage Time. The inspectors determined the finding had a cross-cutting aspect of "Challenge the Unknown" because questions and risks regarding the use of flow M&TE for the test were not properly evaluated and managed before proceeding. [H.11]

Enforcement: Technical Specification 5.4.1.a, "Procedures," required, in part, that written procedures covering the applicable procedures recommended in Appendix A to Regulatory Guide 1.33, "Quality Assurance Program Requirements," of February 1978, shall be established and implemented. Appendix A, Item 9 required, in part, that maintenance activities that can affect the performance of safety-related equipment should be performed in accordance with written documented instructions and appropriate to the circumstances. Contrary to the above, prior to July 23, 2017, the licensee failed to implement work instructions and establish appropriate procedures concerning the use of flow M&TE in support of ESF chilled water pumps IST.

As result, the 1A ESF chiller was inadvertently rendered inoperable when maintenance technicians isolated the flow transmitter associated with chiller start logic when installing and removing flow M&TE in support of IST of the 1A chilled water pump. This violation was entered into the licensee's corrective action program as CR 10390340 and CAR 270610 and planned to revise the procedure. This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. (NCV 05000424 and 05000425/2017003-01, Failure to Implement and Establish Appropriate Work Instructions Affecting Safety-Related Chiller)

b.2 Failure to Maintain ECCS Flow Balance and Check Valve Inservice Test Procedure

Introduction: A Green NRC identified NCV of Technical Specification (TS) 5.4.1.a, "Procedures," was identified for the licensee's failure to maintain Unit 2 procedure 14721D, "Emergency Core Cooling System (ECCS) Subsystem Flow Balance and Check Valve Refueling Inservice Test." Specifically, the procedure did not provide instructions to demonstrate satisfactory performance of the forward flow safety function of the refueling water storage tank (RWST) supply ECCS check valves to the residual heat removal system pumps. The failure to maintain procedure 14721D-2 to ensure test conditions that adequately demonstrated satisfactory performance of ECCS check valves 2-1205-U6-001/002, as required by Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements," of February 1978, was a performance deficiency.

Description: On September 20, 2017, while observing performance of surveillance test procedure 14721D-2 (Unit 2), "ECCS Subsystem Flow Balance and Check Valve Refueling Inservice Test", version 2, NRC inspectors identified a procedural deficiency related to how satisfactory performance of RHR system check valves was verified. The procedure was conducted every outage to demonstrate, in part, that ECCS pumps' performance satisfy full flow requirements and that associated ECCS check valves stroke full-open to provide forward flow.

The inspectors identified that the procedure allowed forward flow testing of the RWST supply check valves to the RHR pumps to be satisfied without actually testing the valves. Specifically, in preparation for the RHR pump and check valve full flow test, Step 6 of Section 4.5 (Train A RHR test) allowed the RHR pump's suction to be aligned to either the normal RCS hot leg loop suction line or the RWST supply line. If aligned to the loop suction line path, then the RWST supply check valve, 2-1205-U6-001, would not be tested as no flow would be established through the valve. Later in Step 29, after establishing full flow conditions, check valve performance would be recorded as 'Satisfactory' without any steps to re-align the pump suction to the RWST. The inspectors identified this issue while observing Section 4.5 of the test and with the 'A' RHR pump aligned to the loop suction line. The same issue was identified in procedure Section 4.6 (Train B RHR test) Step 6 and Step 27. In Section 4.6, check valve 2-1205-U6-002 would not be adequately tested for full forward flow if the 'B' RHR pump suction was aligned to the loop suction line. The inspectors notified the operations shift supervisor directing the test and the test was suspended until the procedure could be reviewed and revised.

The licensee entered this into their corrective action program as CR10410794. The procedure was revised and re-performed on September 27, 2017 with affected check valves performing satisfactorily.

This issue was limited to the unit 2 procedure (14721D-2) which was last revised on September 15, 2017 in preparation for unit 2 refueling outage 19, to allow the RHR pump suction be aligned to the loop suction line in order to minimize reactor cavity level changes during testing.

Analysis: The failure to maintain procedure 14721D-2 to ensure test conditions that adequately demonstrated satisfactory performance of ECCS check valves 2-1205-U6-001/002, as required by Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements," of February 1978, was a performance deficiency. The PD was more than minor because if left uncorrected, it would have the potential to lead to a more significant safety concern. Specifically, if left uncorrected, the PD could result in degradation of ECCS check valves to go undetected and render the RWST to RHR pumps flow path inoperable. The finding was associated to the mitigating system cornerstone. Using Exhibit 2 of IMC 0609, Appendix A, the inspectors determined the finding was of very low safety significance (i.e. Green) because the PD did not result in a loss of the check valve operability or functionality. The finding was assigned a cross cutting aspect of "Resources", because the licensee did not ensure that procedure 14721D-2 was adequate to support nuclear safety. (H.1)

Enforcement: Technical Specification 5.4.1.a, "Procedures," required, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures stated in Appendix A to Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements," of February 1978. RG 1.33, Appendix A, Item 8 stated, in part, that procedures for surveillance tests should be written for ECCS tests. Surveillance test procedure 14721D-2, "ECCS Subsystem Flow Balance and Check Valve Refueling Inservice Test," version 2, tested the forward flow functionality of ECCS check valves 2-1205-U6-001/002. Contrary to the above, on September 15, 2017, the licensee did not maintain surveillance test procedure 14721D-2 to ensure that ECCS check valves would perform satisfactorily in service. This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. This violation was entered into the licensee's corrective action program as CR10410794. (NCV 05000425/2017003-02, Failure to Maintain ECCS Flow Balance and Check Valve Inservice Test Procedure).

2. RADIATION SAFETY (RS)

2RS1 Radiological Hazard Assessment and Exposure Controls (71124.01) (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) of the Unit 2 (U2) reactor building, outside storage building and U1&2 Auxiliary Building, outside storage areas and radioactive waste (radwaste) processing and storage locations. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCAs. 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 selected U2 refueling outage 19 (2R19) tasks. 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 multi-badging 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 direct observations and interviews with licensee staff. Jobs observed included 2R19 pressurizer work in the pressurizer cavity, reactor cavity decon activities and the thimble replacement project in high radiation and contaminated areas. The inspectors also evaluated worker responses to dose and dose rate alarms during selected work activities.

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.

RP activities were evaluated against the requirements of Updated Final Safety Analysis Report (UFSAR) Section 12; Technical Specifications (TS) Sections 5.4 and 5.7; 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

No findings were identified.

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation (71124.08) (Six Inspection Samples Completed)

a. Inspection Scope

Radioactive Material Storage: During tours of indoor and outdoor radioactive material storage areas, the inspectors observed the physical condition and labeling of storage containers and the posting of Radioactive Material Areas. The inspectors also reviewed licensee procedural guidance for storage and monitoring of radioactive material.

Waste Processing and Characterization: During inspector walk-downs, accessible sections of the liquid and solid radwaste processing systems were assessed for material condition and conformance with system design diagrams. Inspected equipment included storage tanks, transfer piping, resin dewatering and packaging components, and abandoned radwaste processing equipment. The inspectors discussed component function, processing system changes, and radwaste program implementation with licensee staff.

The inspectors reviewed the 2016 Annual Radioactive Effluent Report and radionuclide characterizations from 2016 - 2017 for selected waste streams. For primary resin, filters, and Dry Active Waste (DAW), 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. Waste stream mixing and concentration averaging methodology were evaluated and discussed with radwaste staff. The inspectors also reviewed the licensee's process for monitoring changes in waste stream isotopic mixtures.

Shipment Preparation and Records: The inspectors evaluated shipping records for consistency with licensee procedures and compliance with NRC and Department of Transportation (DOT) regulations. The inspectors reviewed emergency response information, DOT shipping package classification, waste classification, radiation survey results, and container handling methodology. Since there were no outgoing shipments during the week of inspection, the inspectors reviewed training records for personnel qualified to perform shipping duties.

Problem Identification and Resolution Problem Identification and Resolution: The inspectors reviewed condition reports in the areas of shipping and radwaste processing. The inspectors evaluated the licensee's ability to identify and resolve the issues.

Inspection Criteria: Radwaste processing, radioactive material handling, and transportation activities were reviewed against the guidance and requirements contained in the licensee's Process Control Program, UFSAR Chapter 11, 10 CFR Part 20, 10 CFR Part 61, 10 CFR Part 71, the Branch Technical Position on Waste Classification and Concentration Averaging (1983 and 2015), and NUREG-1608 "Categorizing and Transporting Low Specific Activity Materials and Surface Contaminated Objects". Documents reviewed during the inspection are listed in the report Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope

Cornerstone: Mitigating Systems

- residual heat removal system (2)
- high pressure injection system (2)
- heat removal system (2)

The inspectors reviewed a sample of the performance indicator (PI) data, submitted by the licensee, for the Unit 1 and Unit 2 PIs listed above. The inspectors reviewed plant records compiled between July 2016 and June 2017 to verify the accuracy and completeness of the data reported for the station. The inspectors verified that the PI data complied with guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," and licensee procedures. The inspectors verified the accuracy of reported data that were used to calculate the value of each PI. In addition, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with PI data.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review

The inspectors screened items entered into the licensee's corrective action program in order to identify repetitive equipment failures or specific human performance issues for follow-up. The inspectors reviewed condition reports, attended screening meetings, or accessed the licensee's computerized corrective action database.

.2 Annual Sample Review of Condition Reports 10368270 and 10381135

a. Inspection Scope

The inspectors conducted a detailed review of CR10381135 associated with a failure of the elastomer diaphragm for valve 1-1208-U4-132.

The inspectors evaluated the following attributes of the licensee's actions:

- complete and accurate identification of the problem in a timely manner
- evaluation and disposition of operability and reportability issues
- consideration of extent of condition, generic implications, common cause, and previous occurrences
- classification and prioritization of the problem

- identification of root and contributing causes of the problem
- identification of any additional condition reports
- completion of corrective actions in a timely manner

b. Findings

No findings were identified. Valve 1-1208-U4-132 is an elastomer diaphragm valve that serves as the isolation valve between the hydrogen header and volume control tank (VCT). The safety-related function of the valve is to act as an ASME Class 2 pressure boundary and the valve is kept in its normally open position. On January 14, 2016, the licensee detected high hydrogen concentrations in room A-47 in the Unit 1 auxiliary building and determined that the hydrogen was coming from valve 1-1208-U4-132. Work order (WO) SNC750395 was generated and completed to tighten the valve bonnet of the valve and stop the hydrogen leakage, but it was noted that the diaphragm was in poor condition and needed to be replaced. The licensee generated CR10169113 which documented the need to replace the diaphragm during the next Unit 1 refueling outage (1R20) due to the valve being unable to be isolated while the unit was online. At that time, the repair work was coded as a priority 4 in the licensee work management system under WO SNC751885, which required the work to be scheduled within 36 weeks. The WO was generated on January 19, 2016 and 1R20 was scheduled for March 2017. The inspectors noted that valve 1-1208-U4-132 was not repaired during 1R20 and then on May 23, 2017 and June 27, 2017, the valve was found to be leaking hydrogen again. These discoveries were documented in CRs 10368270 and 10381135, respectively, and a temporary repair made by installing a leak repair clamp. During the hydrogen leak occurrences in 2016 and 2017, the inspectors noted that hydrogen concentrations remained below limits and did not impact plant operation.

The inspectors determined there was a minor violation of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, for the licensee's failure to correct conditions adverse to quality associated with elastomer diaphragm of valve 1-1208-U4-132. The licensee identified the condition adverse to quality (degraded diaphragm), but failed to correct the condition in a timely manner, which resulted in a repeat hydrogen leak from the valve. The violation was determined to be minor since the hydrogen concentrations remained well below limits, the safety-related function of the valve was not impacted, and operation of the plant was not impacted. The licensee implemented compensatory measures (i.e. air blowers and routine hydrogen monitoring) immediately after each leak occurrence to ensure hydrogen levels did not build up and become a safety concern. The licensee documented the missed opportunity to repair the valve in their corrective program in CR10368653 and the valve is scheduled for repair during 1R21 in October 2018.

.3 Annual Sample Review of CR10398851 and CR10399054

a. Inspection Scope

The inspectors conducted a detailed review of condition reports (CR) 10398851 and 10399054, associated with the inoperability of unit 2 NSCW pump no. 6 when its discharge motor operated valve, 2HV-11612, failed to close on demand.

The inspectors evaluated the following attributes of the licensee's actions:

- complete and accurate identification of the problem in a timely manner
- evaluation and disposition of operability and reportability issues
- consideration of extent of condition, generic implications, common cause, and previous occurrences
- classification and prioritization of the problem
- identification of root and contributing causes of the problem
- identification of any additional condition reports
- completion of corrective actions in a timely manner

b. Findings

Introduction: A Green self-revealing NCV of Technical Specification (TS) 5.4.1.a, "Procedures," was identified for the licensee's failure to perform an adequate cleanliness inspection of Unit 2 nuclear service cooling water system (NSCW) pump no. 6 discharge motor-operated-valve (MOV) 2HV-11612 limit switch compartment, as required by maintenance procedure NMP-ES-017-008. Specifically, grease left over following maintenance prevented the valve from automatically closing when it's associated NSCW pump was shutdown, rendering the pump inoperable. The failure to perform an adequate cleanliness inspection of NSCW pump no. 6 discharge MOV limit switch compartment following preventive maintenance, as required by maintenance procedure NMP-ES-017-008, was a performance deficiency (PD).

Description: The ultimate heat sink at VEGP consists of two trains ('A' and 'B') of NSCW. Each train has three 50-percent capacity pumps, two of which are in-service during normal plant operations. Operators routinely (i.e. monthly) swap an in-service pump with the one in standby. On August 16, Unit 2 reactor operators were swapping NSCW train B pumps by placing pump no. 4 in service and no. 6 in standby. When pump no. 6 was stopped, operators noted the pump's discharge MOV (equipment ID no. 2HV-11612) did not automatically close, as designed. The NSCW pumps are designed to start up with their discharge valve closed for a short period of time to allow an upstream bypass line to slowly fill the system and minimize the effects of water hammer forces upon train start-up following a loss of offsite power. The valve's failure to close renders its associated pump inoperable as the pump will not be able to automatically fill the system. Also, the pump will not start unless its discharge valve is closed, as the pump's start control circuit logic is interlocked with the valve being in the closed position.

The licensee entered this issue into their corrective action program, per condition report (CR) 10398851, and initiated troubleshooting activities. High electrical resistance readings across the MOV's limit switch contact (no. 8 contact) were identified. Closure of this contact satisfies the 'close' logic portion of the valve's control circuit. The high resistance was caused by the presence of oil residue on the contact fingers. The oil originated from a blob of grease found next to the contact's wire terminal on the upper finger base of the limit switch rotor assembly; just above the contact fingers. Also, a sheen of grease coating was found on the limit switch upper gear frame cover. The licensee further inspected the limit switch compartment to identify the source of the grease, but did not identify any evidence of grease leakage past any grease containing components inside the actuator gearbox. Following inspection and cleaning of all

contact fingers, continuity checks verified adequate resistance readings across the no. 8 contact, which indicated that the identified grease/oil was providing enough electrical resistance across the contact to prevent proper operation. The licensee restored the valve, verified proper operation, and restored operability of the NSCW pump.

As evidenced by the 'as-found' grease/oil condition inside the actuator gearbox, and absent any leakage from internal grease containing components, the inspectors determined the most likely source was residue left from the valve's most recent maintenance activity. The actuator was last worked on November 2015 for routine preventive maintenance under work order (WO) SNC506101. The scope of the WO included, in part, inspection and manipulation of grease containing components inside the actuator gearbox, per procedure NMP-ES-017-008, "MOV Mechanical and Electrical Inspections," Ver. 10.2. Step 8.p of the procedure required a final cleanliness inspection of the limit switch compartment, specifically for the upper finger base, just prior to replacing the compartment cover. The inspectors determined maintenance personnel failed to adequately conduct and verify proper cleanliness of the limit switch compartment. This issue was placed in the licensee's corrective action program as, CR10399054.

Analysis: The failure to perform an adequate cleanliness inspection of NSCW pump no. 6 discharge MOV limit switch compartment following preventive maintenance, as required by maintenance procedure NMP-ES-017-008, was a performance deficiency (PD). The PD was more than minor because it was associated with the Human Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the PD rendered the NSCW pump no. 6 inoperable. Using Exhibit 2 of IMC 0609, Appendix A, the inspectors determined that this finding was of very low safety significance (Green) because, although the PD affected the qualification and operability of the NSCW pump no. 6, it did not result in an actual loss of safety system function, and it did not represent a loss of function of one or more than one train for more than its TS allowed outage time or greater than 24 hrs. Specifically, the PD only affected one of three NSCW pumps in the 'B' train and only two pumps were required for operability of the train. The finding was assigned a cross cutting aspect of "Avoid Complacency", because maintenance personnel did not recognize the possibility of making mistakes when performing routine tasks of inspecting and manipulating grease containing components inside the limit switch compartment. In addition, maintenance personnel did not adequately employ a procedural human error prevention step to ensure cleanliness following maintenance. (H.12)

Enforcement: Technical Specification 5.4.1.a, "Procedures," required, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix A to Regulatory Guide (RG) 1.33, "Quality Assurance Program Requirements," of February 1978. RG 1.33, Appendix A, Item 9 recommended, in part, that maintenance activities that can affect the performance of safety-related equipment be covered by written procedures. Maintenance procedure NMP-ES-017-008, "MOV Mechanical and Electrical Inspections," Ver. 10.2 required a final cleanliness inspection of MOV 2HV-11612 limit switch compartment prior to replacing the compartment cover following maintenance. Contrary to the above, on November 11, 2015, the licensee did not implement safety-related maintenance

procedure NMP-ES-017-008 to ensure adequate cleanliness of MOV 2HV-11612 limit switch compartment prior to replacing the compartment cover following maintenance. This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. This violation was entered into the licensee's corrective action program as CR10399054. (NCV 05000425/2017003-03, Failure to Maintain Cleanliness of Motor Operated Valve Limit Switch Compartment).

4OA5 Other Activities

.1 Operation of an Independent Spent Fuel Storage Installation (ISFSI) (60855.1)

a. Inspection Scope

The inspectors performed a walk down of the onsite ISFSI on September 6, 2017. The inspectors observed each cask passive ventilation system to be free of any obstruction allowing natural draft convection decay heat removal through the air inlet and air outlet openings. The inspectors observed associated cask structures to be structurally intact and radiation protection access controls to the ISFSI area to be satisfactory. The inspectors also reviewed surveillance records to verify that daily surveillance requirements were performed as required by technical specifications.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On October 19, 2017, the resident inspectors presented the inspection results to Mr. Daniel Komm and other members of the licensee's staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection period.

4OA7 Licensee Identified Violations

The following violations of very low safety significance (Green) or Severity Level IV were identified by the licensee and are violations of NRC requirements which meet the criteria of the NRC Enforcement Policy, for being dispositioned as a Non-Cited Violation.

- 10 CFR 50, Appendix B, Criterion XI, Test Control stated, in part, that test programs shall be established to assure that all testing required to demonstrate that structures, systems and components will perform satisfactorily in service. UFSAR Section 8.1.4.3.C.2 stated that the onsite electrical system was designed in accordance with IEEE 308-1974, Criteria for Class 1E Power System at Nuclear Generating Stations. IEEE 308-1974 Section 6.3 recommended periodic tests be performed at scheduled intervals to detect deterioration of equipment to demonstrate operability of the components that are not exercised during normal operation. Contrary to the above, the licensee did not establish adequate test control measures to assure that the protective function of all 1E lockout relays were periodically verified. Specifically, there was no preventative maintenance to test the 1E lockout relays for non-MSPI loads. This condition has existed since plant initial operation and was identified during a licensee Nuclear Oversight audit on July 13, 2017. The inspectors

determined this finding was of very low safety significance (Green) because the inspectors found no documented history of in-service failures of 1E lockout relays rendering safety-related equipment inoperative. This issue was documented in the licensee's corrective action program as CR 10381797.

- 10 CFR 20.1501 requires that each licensee make or cause to be made surveys that may be necessary for the licensee to comply with the regulations in Part 20 and that are reasonable under the circumstances to evaluate the extent of radiation levels, concentrations or quantities of radioactive materials, and the potential radiological hazards that could be present. Contrary to the above, on June 28, 2017, the licensee failed to evaluate radiological conditions in room 1-AB-C-94, "Back flushable Filter Crud Tank Pump Room," following the tank being placed in recirculation by Operations. On July 2, 2017, during a routine survey of room 1-AB-C-94, general area dose rates in the area were found to be as high as 600 mrem/hr. On the previous survey, conducted on June 19, 2017, maximum dose rates were found to be as high as 60 mrem/hr. This finding was evaluated using IMC 0609, Appendix C, Occupational Radiation Safety SDP, and was determined to be of very low safety significance (Green) because the finding is not related to ALARA dose planning, did not result in an overexposure or the substantial potential for overexposure, and the ability to assess dose was not compromised due to the use of appropriate personnel dosimetry. Therefore, the inspectors determined the finding to be of very low safety significance (Green). This issue was entered into the licensee's corrective action program as CR 10383067.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:

D. Komm, Plant Manager
D. Myers, Site Vice-President
D. Sutton, Regulatory Affairs Director
D. Thompson, RP Radwaste
E. Berry, Engineering Director
I. White, Licensing Supervisor
J. August, Steam Generator Program Manager
J. Carswell, SNC Corporate RP
J. Churchwell, Site ISI Coordinator
J. Dixon, Radiation Protection Manager
J. Hadaib, NSCW Engineer
J. Santana, BACCP Owner
K. Walden, Licensing Engineer
M. Whorton, Site Welding
M. Williams, RP Superintendent
T. Baker, Security Manager
T. Fowler, Chemistry Manager
T. Krienke, Operations Director

NRC personnel:

Shane Sandal, Chief, Region II Reactor Projects Branch 2

LIST OF REPORT ITEMS

Opened and Closed

05000424/2017003-01	NCV	Failure to Implement and Establish Appropriate Work Instructions Affecting Safety-Related Chiller (1R22)
05000425/2017003-01	NCV	Failure to Implement and Establish Appropriate Work Instructions Affecting Safety-Related Chiller (1R22)
05000425/2017003-02	NCV	Failure to Maintain ECCS Flow Balance and Check Valve Inservice Test Procedure (1R22)
05000425/2017003-03	NCV	Failure to Maintain Cleanliness of Motor Operated Valve Limit Switch Compartment (4OA2)

Closed

None

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

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10029-C, NERC/SERC Standards for Generator Operators, Ver. 3.0
14230-1/2, Offsite AC Circuit Verification and Capacity/Capability Evaluation, Ver. 26/25
18017-C, Abnormal Grid Disturbances/Loss of Grid, Ver. 9.6
NMP-AD-014, Requirements for Compliance with NERC Standards, Ver. 6.1
NMP-AD-014-GL01, Guidelines for Compliance with NERC Standards, Ver. 6.0

Section 1R04: Equipment Alignment

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11405-1 Rev. 8.1, 125V DC 1E Electrical Distribution System Alignment
11405-2 Rev. 8.1, 125V DC 1E Electrical Distribution System Alignment
11744-1, Essential Chilled Water System Alignment, Rev. 14.3
13405-1 Rev. 54, 125V DC 1E Electrical Distribution System
13405-2 Rev. 49, 125V DC 1E Electrical Distribution System
13744A-1, Train A Essential Chilled Water System, 13

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1X3D-AA-G01A Rev. 10, Main One Line Class 1E 125V DC and 120V Vital AC Systems
1X4DB221, Ver. 27.0, Unit 1 P&I Diagram – Safety Related (Essential) Chillers Unit 1 Trains A and B – System No. 1592
2X4DB133-1 Rev. 54, Unit 2 P&I Diagram Nuclear Service Cooling Water System, System No. 1202
2X4DB134 Rev. 31, Unit 2 P&I Diagram Nuclear Service Cooling Water System, System No. 1202
2X4DB135-1 Rev. 28, Unit 2 P&I Diagram Nuclear Service Cooling Water System, System No. 1202
2X4DB135-2 Rev. 29, Unit 2 P&I Diagram Nuclear Service Cooling Water System, System No. 1202
2X4DB161-1, Ver. 46, Unit 2 P&I Diagram – Auxiliary Feedwater System – Condensate Storage and Degasifier System – System No. 1302
2X4DB161-2, Ver. 29, Unit 2 P&I Diagram – Auxiliary Feedwater System – System No. 1302
2X4DB161-3, Ver. 38.0, Unit 2 P&I Diagram – Auxiliary Feedwater System (Aux Feedwater Pump Turbine Driver) – System No. 1302

Other

Auxiliary Feedwater Systems 1302, 2nd Quarter 2017
Emergency Diesel Generator Systems 2403, 2nd Quarter 2017

Section 1R05: Fire Protection Annual/Quarterly

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92730-1, Zone 30 – Auxiliary Building – Level B, ACCW Pump, Train 'A' Fire Fighting Preplan Rev. 1.0
92731-2, Zone 31 – Auxiliary Building – Level B Fire Fighting Preplan Rev. 1.0
92732-2, Zone 32 – Auxiliary Building – Level B, SI Pump, Train 'A' Fire Fighting Preplan Rev. 1.0
92733-2, Zone 33 – Auxiliary Building – Level B Fire Fighting Preplan Rev. 1.0

92791-1, Zone 91 – Control Building – Level A Fire Fighting Preplan, Rev. 4.1
 92792-1, Zone 92 – Control Building – Level A Fire Fighting Preplan Rev. 3.1
 92797-1, Zone 97 – Control Building – Level A Fire Fighting Preplan Rev. 3.0
 92798-1, Zone 98 – Control Building – Level A Fire Fighting Preplan Rev. 3.0
 92803-1, Zone 103 – Control Building – Level A Fire Fighting Preplan Rev. 2.1
 92825A-1 Rev. 5.1, Zone 125A – Control Building – Level 3 Fire Fighting Preplan
 92826A-1 Rev. 3.1, Zone 126A – Control Building – Level 3 Fire Fighting Preplan
 92835-1 Rev. 4.1, Zone 135 – Control Building – Level 3 Fire Fighting Preplan
 92843-2, Zone 143 – Diesel Generator Building – Tunnel A Level B Fire Fighting Preplan,
 Revision 3.0
 92853-2 Rev. 0.2, Zone 153 – Control Building – Level B Fire Fighting Preplan
 92861-2, Zone 161 – Diesel Generator Building Fire Fighting Preplan, Rev. 1.1
 92863-2, Zone 163 – Diesel Generator Building – Train A DFO Day Tank Fire Fighting Preplan,
 Rev. 0.2
 92878-1 Rev. 2.2, Zone 178 – Control Building – Level 3 Fire Fighting Preplan
 92879-1 Rev. 4.1, Zone 179 – Control Building – Level 3 Fire Fighting Preplan
 92880-1 Rev. 2.2, Zone 180 – Control Building – Level 3 Fire Fighting Preplan

Condition Reports generated during the inspection:

10214011, Power Light Out on Halon Control Panel 12304Q3002

Section 1R06: Flood Protection Measures

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11219-1, Aux. and Containment Bldgs. and Miscellaneous Drain Systems Alignment, Rev. 33.1
 17061-C, Annunciator Response Procedure for ALB 61 on Process Control Panel, Ver. 19.4

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1X4DB147-2, P & I Diagram – Aux. Bldg. Flood Retaining Rooms Alarms and Drains – System
 No. 1218, Ver. 9.0
 AX1D08A06-2, Auxiliary Building Floor Plan EL. 220 FT – 0IN Level 1, Ver. 12
 AX1D08A07-2, Auxiliary Building Floor Plan EL. 240 FT – 0IN Level 2, Ver. 8

Other

DC-1003, Flooding – Interdiscipline, Rev. 9
 DC-1218, Auxiliary Building Flood-Retaining Rooms, Alarms, and Drains, Rev. 8
 X6CXC-25, Unit 1 Flooding Analysis – Auxiliary Building, Level 2, Rev. 5
 X6CXC-29, Unit 1 Flooding Analysis – Auxiliary Building, Level 1, Rev. 5

Section 1R07: Heat Sink Performance

Procedures

13150B-1, Train B Service Cooling Water System, Ver. 10
 83305-C, Heat Exchanger Testing/Maintenance Program, Ver. 7.8
 83308-C, Testing of Safety-Related NSCW System Coolers, Ver. 33
 83309-C Ver. 9, Safety-Related Heat Exchanger Inspection
 NMP-ES-012-001, Inspection of Heat Exchangers, Ver. 1.4
 NMP-ES-012-002, Cleaning of Heat Exchangers, Ver. 1.2
 NMP-ES-012-GL01, Heat Exchanger Program Heat Exchanger Inspection, Testing, and
 Condition Assessment, Ver. 4.0

Work Orders

SNC397667, 2403-22403G4001E03, D/G 2A JW Heat Exchanger Insp/Clean, 3/17/16
 SNC662437, 1203-21203E4001, CCW Heat Exchanger Inspection, 3/23/16

Drawings

1X4DB133-1, Nuclear Service Cooling Water System No. 1202, Ver. 54.0
 1XDR024-041, ESF Chiller A Condenser Tubesheet Map, Ver. 1.0
 2X4AE01-00004, Component Cooling Water Heat Exchangers, Rev. 13
 2X4DB135-1, P&I Diagram Nuclear Service Water System No. 1202, Ver. 28.0
 2X4DB149-1, Flow Diagram Cooling Water System, Ver. 5.0
 2XDR024-041, ESF Chiller A Condenser Tubesheet Map, Ver. 1.0
 2XDR024-043, ESF Chiller B Condenser Tubesheet Map, Ver. 2.0

Other

2062151201, 54-month temperature monitoring of train 'B' safety injection pump motor coolers,
 2/16/2007
 2102251601, 54-month temperature monitoring of train 'B' safety injection pump motor coolers,
 9/14/2011
 AX4AD02-00147, NSCW Tower Manual, Ver. 11
 DC-1202, Nuclear Service Cooling Water (NSCW) System, Rev. 13
 DC-1202-A, Nuclear Service Cooling Towers, Rev. 11
 ELV-01212, Letter from W.G. Hairston, III, to USNRC, "Vogtle Electric Generating Plant
 Response to Generic Letter 89-13 Service Water System Problems Affecting Safety-Related
 Equipment," January 25, 1990
 ELV-01212, Vogtle Electric Generating Plant Response to Generic Letter 89-13, 01/25/1990
 ELV-03258, Letter from C.K. McCoy to USNRC, "Vogtle Electric Generating Plant Response to
 Generic Letter 89-13 Service Water System Problems Affecting Safety-Related Equipment,"
 December 5, 1991
 EPRI NP-7552, "Heat Exchanger Performance Monitoring Guidelines
 K11-03-035-54, Report of Eddy Current Inspection, 1B ESF Chiller, 03/15/2011
 NMP-ES-012, Heat Exchanger Program, Ver. 10.2
 NMP-GM-003-F18, Check-In Self-Assessment Plan and Report (Triennial Heat Sink
 Inspection), Ver. 3.0,
 RER # SNC424592, Heat Exchanger Outage Report for Plant Vogtle Outage 1R17
 Safety-Related Heat Exchanger Inspection Record, ESF Chiller 1B-Condenser, 4/4/2011
 Safety-Related Heat Exchanger Inspection Record, ESF Chiller B Condenser Section,
 10/5/2011
 Safety-Related Heat Exchanger Inspection Record, Unit 1 ESF Chiller "A", 10/2/2012
 SNC625773, 54-month temperature monitoring of train 'B' safety injection pump motor coolers,
 1/26/2016
 SNC642736, Unit 2 'B' SI pump motor and lube oil cooler heat exchanger clean and inspection,
 8/8/2017
 SNC803130, Monthly B SI pump motor and lube oil cooler flow test, 1/22/17
 SNC808802, Monthly B SI pump motor and lube oil cooler flow test, 2/24/17
 SNC815140, Monthly B SI pump motor and lube oil cooler flow test, 3/20/17
 SNC820482, Monthly B SI pump motor and lube oil cooler flow test, 4/20/17
 SNC825919, Monthly B SI pump motor and lube oil cooler flow test, 5/22/17
 SNC831141, Monthly B SI pump motor and lube oil cooler flow test, 6/15/17
 SNC836079, Monthly B SI pump motor and lube oil cooler flow test, 7/10/17
 System Health Report – U1 Nuclear Service Cooling Water Systems, Q4-2016

System Health Report – U1 Nuclear Service Cooling Water Systems, Q1-2016
 System Health Report – U1 Nuclear Service Cooling Water Systems, Q4-2015
 System Health Report – U1 Safety Injection System, Q1-2016
 System Health Report – U2 Nuclear Service Cooling Water Systems, Q1-2016
 System Health Report – U2 Nuclear Service Cooling Water Systems, Q1-2015
 System Health Report – U2 Safety Injection System, Q1-2016
 System Health Report – U2 Nuclear Service Cooling Water Systems, Q4-2016
 W11-09-022-148, Report of Eddy Current Inspection, 2B ESF Chiller, 09/26/2011
 Work Order # SNC132272
 Work Order # SNC324816
 Work Order # SNC482484
 Work Order # SNC527422

Calculations

X4CPS1017, Heat Exchanger Tube Plugging Criteria, Ver. 3.0

Corrective Action Documents

SNC 818534
 CAR 268324
 CAR 268263
 CAR 267699
 CAR 266946
 CAR 266163
 CAR 265365
 CAR 261373
 CAR 259597

Section 1R08: Inservice Inspection Activities

Procedures:

25023-C, General Large Bore Piping Installation, Ver. 8.0
 LMT-10-PAUT-007, Curtiss-Wright Fully Encoded Phased Array Ultrasonic Examination of Dissimilar Metal Piping Welds, Rev. 2
 NMP-ES-019, Boric Acid Corrosion Control Program, Ver. 11.1
 NMP-ES-019-001, Boric Acid Corrosion Control Program Implementation, Ver. 11.1
 NMP-ES-019-003, Boric Acid Deposit Sampling, Analysis and Data Evaluation, Ver. 2.1
 NMP-ES-024-301, Liquid Penetrant Examination Color Contrast and Fluorescent, Ver. 13.0
 NMP-ES-024-602, Radiography Using Phosphor Imaging Plates, Ver. 3.0
 NMP-ES-091-004, Boric Acid Corrosion Control Program – Corrosion Assessment, Ver. 5.1

Drawings:

2X2D48A001, Containment Internals Concrete Forming Plan at El. 171'-9", Rev. 6

Work Orders/Work Requests:

SNC795543, Replacement of Feedwater Line 2-1305-155-6", Rev. 1
 SNC795543-26, 1305-21305 Pipe Weld Repair, Rev. 2
 SNC857284, Repair/Rework Various Packing Adjustments/Torque Checks in Unit 2 Containment (including 21204X4225), Rev. 0
 SNC879053, 1201-21201B6002 - Perform Weld Repair on SG2 Steam Leak, Rev. 0

Condition Reports:

CR867559, Dry, White Residue Noted on Valve 21204X4225, dated 09/17/2014

NDE Examiner Qualifications:

Curtiss-Wright Certification of Visual Acuity and Color Vision per LMT Procedure PVE-1 (Jensen), dated 6/7/17
 Curtiss-Wright Certification of Visual Acuity and Color Vision per LMT Procedure PVE-1 (Block), dated 7/28/17
 Curtiss-Wright Certification of Visual Acuity and Color Vision per LMT Procedure PVE-1 (Devers), dated 7/21/17
 Curtiss-Wright Personnel Certification Statement: UT LII (Block), dated 08/04/2017
 Curtiss-Wright Personnel Certification Statement: UT LIII (Devers), dated 08/04/2017
 Curtiss-Wright Personnel Certification Statement: UT LIII (Jensen), dated 08/04/2017
 International Quality Consultants, Inc. Certificate of Qualification and Certification Summary: PT (Rudisill), dated 1/31/2017
 International Quality Consultants, Inc. Vision Examination (Rudisill), dated 1/31/17
 MISTRAS NDT Certification Record: RT LII (Coffey), dated 1/31/2017
 MISTRAS NDT Certification Record: RT LIII (Miller), dated 3/6/2017
 MISTRAS Visual Acuity Record (Coffey), dated 12/01/2016
 MISTRAS Visual Acuity Record (Miller), dated 12/01/2016

Miscellaneous Documents:

1012, Liquid Penetration Examination Record: SNC879053, dated 9/27/17
 1208-2017-002, Corrosion Assessment Evaluation Form: 2HV8154, dated 7/19/17
 1208-2017-003, Corrosion Assessment Evaluation Form: 2HV8104, dated 7/20/17
 1208-2017-004, Corrosion Assessment Evaluation Form: 2HV8438, dated 8/15/17
 530, Procedure Qualification Record, Rev. dated 3/8/84
 531, Procedure Qualification Record, Rev. dated 4-11-84
 532, Procedure Qualification Record, Rev. dated 5/29/84
 557, Procedure Qualification Record, Rev. dated 5/21/84
 795543-R1, ASME Section XI Repair/Replacement Traveler, Rev. 1
 795543-T1, ASME Section XI Repair/Replacement Traveler, Rev. 0
 FNP-100, Record of Welder Performance Qualification Test (Baker), dated 09/07/2010
 FNP-106, Record of Welder Performance Qualification Test (Baker), dated 09/14/2010
 FNP-3, Record of Welder Performance Qualification Test (Baker), dated 09/07/2010
 FNP-ST-5, Record of Welder Performance Qualification Test (Baker), dated 09/15/2010
 GTSM-15-O-1, Weld Procedure Specification, Rev. 7
 HNP-40, Record of Welder Performance Qualification Test (Baker), dated 01/28/2014
 HNP-54, Record of Welder Performance Qualification Test (Baker), dated 01/27/2016
 ISI-21201-V6-001-W34, Curtiss-Wright Vendor Report: Vogtle Electric Generating Plant, Loop 1 RPV Inlet Safe-End to Nozzle, dated 09/21/2017
 ISI-21201-V6-001-W35, Curtiss-Wright Vendor Report: Vogtle Electric Generating Plant, Loop 2 RPV Inlet Safe-End to Nozzle, dated 09/21/2017
 ISI-21201-V6-001-W38, Curtiss-Wright Vendor Report: Vogtle Electric Generating Plant, Loop 3 RPV Inlet Safe-End to Nozzle, dated 09/21/2017
 ISI-21201-V6-001-W39, Curtiss-Wright Vendor Report: Vogtle Electric Generating Plant, Loop 4 RPV Inlet Safe-End to Nozzle, dated 09/20/2017
 Post weld Heat Treatment (PWHT) Record for WO No. SNC795543, dated 10/3/17

SG-SGMP-16-11, Vogtle 2R18 Steam Generator Condition Monitoring and Operational Assessment, Rev. 0

SNC-TS6-1, Record of Welder Performance Qualification Test (Benson), dated 09/15/2017

SNC-TS6-1, Record of Welder Performance Qualification Test (Langston), dated 09/15/2017

SNC-TS6-O, Record of Welder Performance Qualification Test (Baker), dated 09/08/2017

V-17-RT-302-0176, MISTRAS Computed Radiography Examination Report: 21305155-6", dated 9/27/17

V-17-RT-302-0181, MISTRAS Computed Radiography Examination Report: 21305155-6", dated 9/27/17

Weldstar Certificate of Compliance/Conformance (PO# SNG10073026), dated January 31, 2014

Section 1R11: Licensed Operator Requalification Program and Licensed Operator Performance

Procedures

112004-C, Power Operation, Ver. 119.3

12006-C, Unit Cooldown to Cold Shutdown, Ver. 103

18001-C Primary Systems Instrumentation Malfunction, Ver. 37.1

18004-1 Reactor Coolant System Leakage, Ver. 30.1

18011-1 Turbine Trip Below P-9, Ver. 1

18012-1 Turbine Run Back, Ver. 1

19000-1 E-0 Reactor Trip or Safety Injection, Ver. 2.1

19010-1 E-1 Loss of Reactor or Secondary Coolant, Ver. 2.

NMP-EP-110 Ver. 8.1, Emergency Classification Determination and Initial Action

NMP-EP-110-GL03 Ver. 9, VEGP EALs –ICS, Threshold Values and Basis

NMP-EP-111 Ver. 11.0, Emergency Notifications

Other

V-RQ-SE-17401, As-Found Segment 20174, Ver. 1.0

V-RQ-SE-17404, Loss of Core Cooling, Ver. 1.0

Section 1R12: Maintenance Effectiveness

Procedures:

NMP-ES-027-001, Maintenance Rule Implementation, Ver. 8

Procedures

NMP-AD-002, Problem Solving and Troubleshooting Guidelines, Ver. 12.0

NMP-GM-002-001, Corrective Action Program Instructions, Ver. 34.0

Corrective Action Program Records

Condition Reports (CRs)

10229803, 2A EDG control power A failure

10232634, 2A EDG tachometer not working

10320302, 2A EDG control power B failure

10340120, 2A EDG failed to start while performing during fast start surveillance

10371573, EDG HVAC Maintenance Rule function re-evaluation

338236, Unexpected LCO entry due to 2A EDG control power failure

762069, 2A EDG emergency light socket minor damage

Maintenance Work Orders

SNC793331, 2A EDG Control A Power light socket replacement, 6/1/16
 SNC794842, Investigate/inspect 2SI19186, diesel generator tachometer, 6/9/16
 SNC839624, Repair 2A EDG Control B Power failure

Drawings

2X4DB217, P I & Diagram – Diesel Generator Building, HVAC System No. 1566, Ver. 15.0

Other

NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Rev. 4A

Section 1R13: Maintenance Risk Assessments and Emergent Work ControlProcedures

NMP-GM-031-001, Online Maintenance Rule (a)(4) Risk Calculations, Ver. 3.0
 10032-C, Outage Risk Assessment Monitoring, Ver. 11

Other

2-DT-17-1555-00134, 2B Safety Injection Pump Room Cooler
 Unit 1, EOOS Integrated Risk Report, August 9, 2017
 Unit 1, EOOS Importance Calculator Results, August 9, 2017
 Unit 2, EOOS Importance Calculator Results, August 16, 2017
 Unit 2, Narrative Control Room Logs for August 16-17, 2017
 Unit 2, EOOS Integrated Risk Report, August 21, 2017
 Unit 2, EOOS Importance Calculator Results, August 21, 2017
 Unit 2, Narrative Control Room Logs for August 21, 2017
 Unit 1, EOOS Importance Calculator Results September 17, 2017
 Unit 1, Narrative Control Room Logs for September 17-22, 2017
 Vogtle Unit 1 Daily Work Schedule (Sept 18-22 week)

Corrective Action Program Records

Condition Reports (CRs)
 CR10402230, AMSAC not updated in EOOS (NRC-ID)

Section 1R15: Operability Determinations and Functionality AssessmentsProcedures

NMP-AD-012, Operability Determinations and Functionality Assessments, Ver. 13.1
 83308-C, Testing of Safety-Related NSCW System Coolers, Ver. 33

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1X3D-BG-B01E, Elementary Diagram – Containment Heat Removal System 1-1501-A7-005-M01, Ver. 7.0

Corrective Action Program Records

Condition Reports (CRs)
 10382074, Unit 2 steam generator #2 steam leak in containment
 10384122, CR to track PDO and OBDN actions of U2 Steam Generator #2 steam leak
 10386816, High Speed Fan #5 did not have an amber light when tripped during 14606
 10390340, Unit 1 train A ESF chiller tripped
 10404327, Identified extent of condition for Unit 2 NSCW motor no. 4 failure

10404464, Extent of condition finding results – NSCW motor junction box

Work Orders

SNC892010, Apply RTV and check T-drains on unit 1 NSCW pump motor junction boxes
SNC892018, Apply RTV and check T-drains on unit 2 NSCW pump motor junction boxes

Other

DOEJ-VX217001-M001, Unit 2 Steam Generator Loop #2 Steam Leak, Ver. 3.0
Standing Order 2-2017-5, Monitoring Leakage Characteristics for Unit 2 SG #2 steam leak
X3AR01-E8, Raceway Systems for VEGP, Rev. 36

Section 1R19: Post Maintenance Testing

Procedures

10008-C, Recording Limiting Conditions for Operation, Ver. 30
25718-C, Heat Shrink Insulation for Control and Power Cable Splices and Terminations, Ver. 37
NMP-OS-010-F02, Protected Train/Division or Equipment Work Request, Ver. 1.0
25719-C, Electrical Integrity and Configuration Control, Ver. 24.1
83308-C, Testing of Safety-Related NSCW System Coolers, Ver. 33
NMP-MA-009-F01, FME Checklist, Ver. 7.0
28212-C, IST Program Valve Set Pressure Testing, Ver. 15.0

Completed Procedures

14802B-2, Train B NSCW Pump/Check Valve IST and Response Time Test, Ver. 8.2
14804B-2, Safety Injection Pump B In-service and Response Time Tests, Completed 8/8/2017

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1X3D-BG-G02B, Elementary Diagram – Safety-Related (Essential) Chillers 1-1592-C7-002-M01, Ver. 21.0
1X3D-BG-G02D, Elementary Diagram – Safety-Related (Essential) Chillers 1-1592-C7-002-M01, Ver. 12.0
1X4DB221, Ver. 27.0, Unit 1 P&I Diagram – Safety Related (Essential) Chillers Unit 1 Trains A and B – System No. 1592
1X5DV150, Instrument LOOP Diagram ESF Chiller Chilled Water Flow, Rev. 6
1X6AU01-00798-8, ESF Chiller Chilled Water Flow Cabinet QP2 Card Frame 05, Rev. 7
2X4DB121, Ver. 50.0, Unit 2 P&I Diagram – Safety Injection System – System No. 1204
AX4AJ04-00139, Emergency Safety Feature Chillers Line Diagram - Sheet 3, Ver. 8.0
AX4AJ04-00140, Emergency Safety Feature Chillers Line Diagram - Sheet 2, Ver. 1.0
AX4AJ04-00141-7, Emergency Safety Feature Chillers Line Diagram - Sheet 3, Ver. 5

Corrective Action Program Records

Condition Reports (CRs)

10385142, 1B ESF Chiller Hi-Evap Water Temperature Alarm
10395806, Unit 2 'B' SI lube oil cooler low cooling water flow

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SNC841267, Monthly B SI pump motor and lube oil cooler flow test, 8/8/17
SNC881161, Investigate 1B ESF chiller High Evap Water Temp alarm/condition
SNC888104, Unit 2 'B' SI lube oil cooler low flow troubleshooting and corrective maintenance, 8/9/17
SNC889694, Unit 2 'B' train NSCW pump no. 6 discharge motor-operated valve repair, 8/16/17

Other

Tagout 2-DT-17-1204-00133, Train SI pump motor
LCO/TR Status Sheet No. 2-2017-061

Section 1R20: Refueling Outage and Other ActivitiesProcedures

12004-C, Power Operation, V119.3
12006-C, Unit Cooldown to Cold Shutdown, V103

Other

Core Map Certification for Unit 2 Cycle 20, 9/27/17

Section 1R22: Surveillance TestingCompleted Procedures

14384-2, Unit 2 Containment Penetration No. 84 Containment Purge Exhaust Local Leak Rate Test, completed 9/29/17
14721D-2, Unit 2 ECCS Subsystem Flow Balance and Check Valve Refueling In-service Test, completed 9/27/17
14809A-1, Unit 1 '1A' ESF chiller pump IST, completed 7/24/17
14980B-2, Unit 2 Diesel Generator 2B Operability Test, completed 7/19/17

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2X4DB111, Ver. 36.0, Unit 2 P&I Diagram – Reactor Coolant System – System No. 1201
2X4DB121, Ver. 50.0, Unit 2 P&I Diagram – Safety Injection System – System No. 1204
2X4DB122, Ver. 54.0, Unit 2 P&I Diagram – Residual Heat Removal – System No. 1205
2X4DB213-1, P&I Diagram, Purification and Clean-up System, System No. 1505, 1506, & 1508
Ver. 34
2X4DB221, P&I Diagram, Safety Related (Essential) Chillers, Unit 2 Trains A and B, System No. 1592, Ver. 25.0

Corrective Action Program RecordsCondition Reports (CRs)

10388762, 2B EDG fuel injector leak
10388856, 2B EDG mechanical relay flag dropped
10390340, Unit 1 Train A ESF Chiller tripped
10410794, NRC ID issue with 14721D-2

Corrective Action Report (CAR)

270610, Human Performance Cause Analysis for Unit 1 'A' ESF chiller tripped

Work Orders

SNC409711, Containment Penetration No. 84 LLRT, 3/25/16
SNC634389, A ESF Chiller Comprehensive Test, 7/24/17

Other

ASME OM Code-2001, Code for Operation and Maintenance of Nuclear Power Plants
ASME OM Code-2004, Code for Operation and Maintenance of Nuclear Power Plants
GEN-96, 10 CFR 50 Appendix J Program Manual, Rev. 11
Human Performance Review Board Summary associated with CR10390340

U.S. Nuclear Regulatory Commission, "Guidelines for Inservice Testing at Nuclear Power Plants: Inservice Testing of Pumps and Valves and Inservice Examination and Testing of Dynamic Restraints (Snubbers) at Nuclear Power Plants — Final Report," NUREG-1482, Revision 2, October 2013

Unit 1, Narrative Control Room Logs for July 23-24, 2017

V1-17-033, Incident Response Team (Attachment 1 – 4) associated with CR10390340

Vogtle Electric Generating Plant Fourth 10-Year Interval Inservice Testing (IST) Program Update," May 17, 2017

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedures, Guidance Documents, and Manuals

43014-C, Special Radiological Controls, Ver. 57

NMP-HP-108, Issuance, Use, and Collection of Personnel Dosimetry, Ver. 2.6

NMP-HP-202, Radiological Controls for Highly Radioactive Objects, Ver. 2.1

NMP-HP-206, Issuance, Use, and Control of Radiation Work Permits, Ver. 4.2

NMP-HP-300, Radiation and Contamination Surveys, Ver. 4.2

NMP-HP-301, Airborne Radioactivity Sampling and Evaluation, Ver. 3.8

NMP-HP-302, Restricted Area Classification, Postings, and Access Control, Ver. 9.1

NMP-HP-302-001, Radiological Key Control, Ver. 2.8

NMP-HP-302-002, Radioactive Material Labeling Instruction, Ver. 1.1

NMP-HP-302-004, Control of Discrete Radioactive Particles, Ver. 1.1

NMP-HP-304, Decontamination of Areas, Tools, and Equipment, Ver. 2.2

NMP-HP-305, Alpha Radiation Monitoring, Ver. 5.5

NMP-HP-400, Control and Accountability of Radioactive Sources, Ver. 3.6

NMP-HP-403, Control and Monitoring of Materials in Radiation Controlled Areas, Ver. 3.4

NMP-HP-404, Release of Materials from the RCA and Protected Areas, Ver. 3.0

Records and Data

RWP 17-0105, Operation Rounds, Surveillances, and Valve Line Ups Including Surveillances by Helpers, Rev 0

RWP 17-0121, Decon Activities In Locked High Radiation Areas, Highly Contaminated Areas, and/or Airborne Areas.

RWP 17-0136, Emergent Work (Mech, Elec, I&C, Including Support Work Groups) In Locked High Radiation/Airborne Areas, Rev 0

RWP 17-2411, Thimble Tube Replacement Project and All Associated Work, Rev 0

RWP 17-2414, Thimble Tube Replacement Project and All Associated Work, Rev 0

RWP 17-2612, Inspect and Repair Valve 2PV0455C and All Associated Work, Rev 0

RWP Dose Report RWP 17-2411, Thimble Tube Replacement Project and All Associated Work, 09/28/2017

RWP Dose Report RWP 17-2414, Thimble Tube Replacement Project and All Associated Work, 09/28/2017

RWP Dose Report RWP 17-2612, Inspect and Repair Valve 2PV0455C and All Associated Work, 09/28/2017

Air Sample (A/S) Results Summary Database File, September 2017

A/S # 17-0830, Fuel Cleaner Support, Reactor Refuel Bay

A/S # 17-0951, Flux Tube Work, U2 CTMT Seal Table

A/S # 17-0966, Thimble Cutting, U2 CTMT Cavity Edge

A/S # 17-1032, 0455C Valve Breach, U2 CTMT 206ft PZR

Plant Vogtle Radiological Information Survey #s:

41215, Back flushable Filter Crud Tank Room (1AXC13)

205956, Back flushable Filter Crud Tank Pump Room (1-AB-C-94)
 206186, Back flushable Filter Crud Tank Pump Room (1-AB-C-93)
 206300, Back flushable Filter Crud Tank Pump Room (1-AB-C-93)
 206301, Back flushable Filter Crud Tank Pump Room (1-AB-C-94)
 208531, Lower Cavity (2RXAI17)
 208634, Fuel Uender (2RXAI16)
 209317, Upper Cavity (2RXAI18)
 209326, Upper Cavity (2RXAI18)
 209331, Upper Cavity (2RXAI18)
 209308, PZR Compartment – 201 ft. el. (2RXAU1)
 209353, Upper Cavity (2RXAI18)
 207688, Unit 2 Transfer Canal (2FHBC1)
 207758, Valve gallery CVCS Cation Demin (1AXA33)

File, Spent Fuel Pool Inventory Log, Non Fuel Radioactive Material Stored in Unit 1 and Unit 2 Spent Fuel Pool, 09/14/2017

NSTS Annual Inventory Reconciliation Report 01/09/2017 The only source is The J.L.

Shepherd calibration source, Cs-137, Model 6810, Serial Number 83CS 24, initial activity 400 Ci (11/01/1986), activity as of 07/31/2017 – 197.07 Ci.

Radioactive Source Inventory and Leak Test Results, 07/14/2017

Corrective Action Program (CAP) Documents

Focused Area Self-assessment, Radiological Hazards Analysis Assessment, 7/24/17 – 7/28/17
 Condition Report (CR) 10194605

CR 10195140
 CR 10195216
 CR 10196825
 CR 10198049
 CR 10198068
 CR 10217801
 CR 10241247
 CR 10251034
 CR 10346591
 CR 13071979
 CR 10376110
 CR 10383067
 CR 10400522
 CR 10400529
 CR 10403004
 CR 10406316

Section 2RS8: Radioactive Material Processing and Transportation

Procedures, Guidance Documents, and Manuals

14905-1, RCS Leakage Calculation (Inventory Balance), Ver. 73.1
 NMP-GM-002-001, Corrective Action Program Instructions, Ver. 36.0
 NMP-HP-403, Control and Monitoring of Materials in Radiation Control Areas, Ver. 3.4
 NMP-HP-405, Shipment of Radioactive Waste and Radioactive Material, Ver. 3.2
 NMP-HP-408, Solid Radioactive Waste Scaling Factor Determination and Implementation and Waste Classification, Ver. 2.0
 NMP-HP-415, Storage of Radwaste in Outdoor Process Shields, Ver. 2.1
 Process Control Program (PCP) Rev. 11

Records and Data

Annual Radioactive Effluent Release Report for 2016
 DAW and Miscellaneous Waste Fractional Abundance Determination, DAW, 8/29/17
 Sample Data Set Validation, 2016 U1 RCS Filter, 2/9/17
 Sample Data Set Validation, 2016 U2 RCS Filter, 2/9/17
 Certificate of Completion, DOT/NRC Radioactive Waste Packaging, Transportation, and Disposal Training, 6/12/15 and 7/31/15
 Licensing Document Change Request No. 2014008, U2 Replacement of Seal Injection Filter System with Sub-micron Filter System, 9/19/14
 List of Radioactive Material Storage Areas, 9/18/17
 Radioactive Shipment No. RVRS-15-008, LSA, Resin
 Radioactive Shipment No. RVRS-16-061, Type B, Resin
 Radioactive Shipment No. RVRS-17-006, Type B, Resin
 Radioactive Shipment No. RVRS-17-011, Type B, Resin
 Radioactive Shipment No. RVRS-17-014, LSA, Filters
 Shipment Logs, 1/6/15 – 9/8/17
 Work Order SNC862264, Quarterly Visual Inspection of Outside Radioactive Material, 11/8/17

CAP Documents

Focused Area Self-assessment, Radiological Hazards Analysis Assessment, 7/24/17 – 7/28/17
 CR 10386258
 CR 10200339
 CR 10188794
 CR 10174090
 CR 10414170

Section 40A1: Performance Indicator (PI) VerificationProcedures, Guidance Documents, and Manuals

00163-C, NRC Performance Indicator & Monthly Operating Report Preparation & Submittal, Rev. 14.6

Section 40A2: Problem Identification and ResolutionProcedures

NMP-ES-017-008, "MOV Mechanical and Electrical Inspections," Ver. 10.2

Corrective Action Program RecordsCondition Reports (CRs)

10168726, Unit 1 airborne issues
 10169113, Need maintenance WO to replace diaphragm on 11208U4132
 10169119, Need maintenance WO for leak repair of 11208U4132
 10368270, Aux. Bldg. A-47 had hydrogen concentration of 42% of the LEL in small area 12 feet up in room
 10368653, Missed opportunity to repair valve associated with H2 leak
 10381135, Valves 11208U4116/132 found leaking H2 and noble gases in A-47
 10398851, 2HV11612 did not close after NSCW pump 6 was stopped
 10399054, Grease on limit switch finger board and limit switch contact
 10402842, Parts to be quarantined during 1R21 for valves 11208U4116/132

Maintenance Work Orders

SNC506101, 2HV11612-MO NSCW pump no. 6 discharge MOV clean/inspect/lube, 11/10/15

SNC889694, Unit 2 'B' train NSCW pump no. 6 discharge motor-operated valve repair, 8/16/17

LIST OF ACRONYMS

2R19	Unit 2 Refueling Outage 19
CAP	Corrective Action Program
CR	Condition Report
DAW	Dry Active Waste
DOT	Department of Transportation
ED	Electronic Dosimeter
IP	Inspection Procedure
HRA	High Radiation Area
LHRA	Locked High Radiation Area
OA	Other Activities
Radwaste	radioactive waste
RCA	Radiologically Controlled Area
RG	Regulatory Guide
RP	Radiation Protection
RS	Radiation Safety
RWP	Radiation Work Permit
TS	Technical Specification
U2	Unit 2
UFSAR	Updated Final Safety Analysis Report
VHRA	Very High Radiation Area