



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II**

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ATLANTA, GEORGIA 30303-1257

February 6, 2018

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 05000424/2017004,
05000425/2017004 AND 07201039/2017001**

Dear Mr. Myers:

On December 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Vogtle Electric Generating Plant, Units 1 and 2. On January 17, 2018, the NRC inspectors discussed the results of this inspection with Mr. Dom Sutton and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. These findings involved violations of NRC requirements. Further, inspectors documented a licensee-identified violation which was determined to be of very low safety significance. The NRC is treating these violation 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 a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the 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.

D. Myers

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

Sincerely,

/RA/

Alan Blamey, Chief
Reactor Projects Branch 2
Division of Reactor Projects

Docket Nos.: 50-424, 50-425, 072-1039
License Nos.: NPF-68 and NPF-81

Enclosure:
Inspection Report 5000424/2017004,
05000425/2017004 and 07201039/2017001
w/Attachment: Supplemental Information

cc Distribution via ListServ

D. Myers

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COMMISSION INTEGRATED INSPECTION REPORT 05000424/2017004,
05000425/2017004 AND 07201039/2017001 February 6, 2018

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-424, 50-425, and 072-1039

License Nos.: NPF-68, NPF-81

Report No.: 05000424/2017004, 05000425/2017004, and 07201039/2017001

Licensee: Southern Nuclear Operating Company, Inc.

Facility: Vogtle Electric Generating Plant, Units 1 and 2

Location: Waynesboro, GA 30830

Dates: October 1, 2017 through December 31, 2017

Inspectors: M. Endress, Senior Resident Inspector
A. Alen, Resident Inspector
R. Carrion, Senior Reactor Inspector (4OA5)
J. Rivera, Health Physicist (2RS6, 4OA1)
B. Pursley, Health Physicist (2RS7, 4OA1)

Approved by: Alan Blamey, Chief
Reactor Projects Branch 2
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000424/2017004, 05000425/2017004, and 07201039/2017001, 10/01/2017, through 12/31/2017; Vogtle Electric Generating Plant, Units 1 and 2; Operability Determinations and Functionality Assessments, Problem Identification and Resolution.

The report covered a three-month period of inspection by resident inspectors and regional inspectors. There are two self-revealing violations documented in this report which were determined to be of very low safety significance and one licensee-identified violation. 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.

Self-Revealing Findings

Cornerstone: Mitigating Systems

- (Green). A Green, self-revealing, non-cited violation (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 post-maintenance testing (PMT) of the Namco limit switch on Unit 2 for 2HV-8920 following removal and reinstallation of the limit switch. As a result, during ECCS interlock testing, 2HV-8804B (RHR Pump B to SI Pump B Isolation Valve) failed to open due to 2HV-8920 Namco limit switch being installed improperly. The licensee's failure to perform a PMT on the Namco limit switch for 2HV-8920 following removal and reinstallation, as required by NMP-MA-014-001 (Post Maintenance Testing Guidance), was a performance deficiency (PD). The licensee reinstalled the limit switch correctly and performed the interlock testing satisfactory following the corrective maintenance. The issue was entered into the corrective action program (CAP) as condition report (CR) 10410863.

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 ECCS valve interlock system. The finding was of very low safety significance (e.g. Green) because while logic path II (2HV-8920 and 2HV-8814) for the opening of 2HV-8804B was inoperable, the system maintained its functionality due to the availability of logic path I (2HV-8813). The inspectors determined there was no cross-cutting aspect since the finding is not indicative of current performance. (Section 1R15).

- (Green). A Green, self-revealing, NCV of TS 5.4.1.a, "Procedures," was identified for the licensee's failure to properly implement and establish procedures to maintain watertight requirements of the nuclear service water system (NSCW) pumps' motor main power cables

termination box. As a result, the Unit 2 "B" train NSCW pump no. 4 failed due to a phase-to-ground fault caused by water and moisture intrusion into the power cable splice connections. Failure to adequately implement and establish procedures to maintain watertight requirements of the NSCW pumps' motor main power cables termination box during maintenance, as required by maintenance procedures and specifications, was a performance deficiency. The licensee replaced the motor and faulted cable; and sealed all potential water and moisture intrusion enclosure locations until watertight enclosure standards are fully restored. This issue was entered into the licensee's CAP as CRs 10399125, 10404327, and corrective action report 270905.

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 (e.g. core damage). Specifically, the Unit 2 NSCW pump no. 4 was rendered inoperable, adversely affecting the NSCW system reliability. The finding was determined to be of very low safety significance (Green) because 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 Technical Specification (TS) allowed outage time or greater than 24 hrs. The finding was assigned a cross-cutting aspect of "Resources," because procedures and/or work instructions were not available to maintenance personnel for properly verifying motor termination boxes were installed in compliance with NEMA 4 specifications. (H.1) (Section 4OA2.2).

Licensee-Identified Findings

One violation of very low safety significance was identified by the licensee and has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into their CAP. This violation 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 was shut down for planned refueling outage cycle 19 (2R19), at the beginning of the inspection period. The unit was restarted on October 3, 2017, and attained full RTP on October 6, 2017. On November 7, at approximately 0200, operators reduced power to approximately 65 percent to repair a speed sensor on the "B" train main feedwater pump. On November 8, 2017, the unit was returned to full RTP and remained at or near full RTP 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

Seasonal Extreme Weather Conditions: The inspectors conducted a detailed review of the station's adverse weather procedures for extreme low temperatures. The inspectors verified that weather-related equipment deficiencies identified during the previous year had been placed into the work control process and/or corrected before the onset of seasonal extremes. The inspectors evaluated the licensee's implementation of adverse weather preparation procedures and compensatory measures before the onset of and during seasonal extreme weather conditions.

The inspectors evaluated the following risk-significant systems:

- Units 1 and 2 nuclear service water system (NSCW)
- Unit 1 auxiliary feed water (AFW) system

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 three systems were correctly aligned by performing partial walkdowns. The inspectors determined the correct system lineup by reviewing plant procedures and drawings.

- Unit 2, emergency core cooling system's "A" train centrifugal charging pump (CCP) with the "B" train CCP out of service (OOS) for testing and maintenance.

- Unit 1, “B” train emergency diesel generator (EDG) with “A” train EDG OOS due to repair of a fuel oil filter leak and modification to the EDG control panel “Power Available” light indication.
- Unit 2, “B” EDG with “A” train EDG OOS for maintenance and testing.

Complete Walkdown: The inspectors verified the alignment of the Unit 1 AFW system. The inspectors selected this system for assessment because it is a risk-significant mitigating system. The inspectors determined the correct system lineup by reviewing plant procedures, drawings, the updated final safety analysis report, and other documents. The inspectors reviewed records related to the system outstanding design issues, maintenance work requests, and deficiencies. The inspectors verified that the selected system was correctly aligned by performing a complete walkdown of accessible components.

To verify the licensee was identifying and resolving equipment alignment discrepancies, the inspectors reviewed corrective action documents, including CRs and outstanding work orders, as well as periodic reports containing information on the status of risk-significant systems, including maintenance rule reports and system health reports. Documents reviewed are listed in the Attachment.

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 four fire areas.

- Unit 1 “A” EDG and electrical tunnel, fire zones 143, 161, and 163
- Unit 1 NSCW tower pump rooms and electrical tunnels, fire zones 145, 146, 160A, and 160B
- Unit 2 containment, fire zones 140A, 140B, 140C, and 140E.
- Unit 2 NSCW tower pump rooms and electrical tunnels, fire zones 145, 146, 160A, and 160B.

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 CAP
- material condition and operational status of fire protection equipment

Fire Drill Observation: The inspectors observed the licensee's fire brigade performance during a fire drill on December 1, 2017, and assessed the brigade's capability to meet fire protection licensing basis requirements. The inspectors observed the following aspects of fire brigade performance:

- capability of fire brigade members
- leadership ability of the brigade leader
- proper use of turnout gear and fire-fighting equipment
- team effectiveness
- compliance with site procedures

The inspectors also assessed the ability of control room operators to combat potential fires including identifying the location of the fire, dispatching the fire brigade, and sounding alarms.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

Underground Cables: The inspectors reviewed related flood analysis documents and inspected the areas listed below containing cables whose failure could disable risk-significant equipment. The inspector directly observed the condition of cables and cable support structures and, as applicable, verified that dewatering devices and drainage systems were functioning properly. In addition, the inspectors verified the licensee was identifying and properly addressing issues using the CAP.

- Unit 1, pull box no. 1NE7ADKEM39
- Unit 1, pull box no. 1NE7ADKEM40
- Unit 1, pull box no. 1NE9GHKEPB01

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-17501, As-Found DEP Scenario, Ver. 1.0, administered to an operating crew, on November 27, 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 reactor startup on October 2, 2017, and then again on November 22, 2017, during a Unit 1 online main turbine resistance temperature detector trip test.

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 issues 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.

- Units 1 and 2, anticipated transient without trip (ATWT) mitigation system actuation circuitry (AMSAC) maintenance and testing mode issues
- Units 1 and 2, NSCW level instrumentation
- Unit 2, turbine driven AFW (TDAFW) DC power supply

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the four 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 CAP. 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, October 30, GREEN risk profile and risk management actions (RMAs) associated with 2B CCP outage for planned maintenance with 2B EDG out of service for testing.
- Unit 2, November 13, GREEN risk profile and RMAs associated with 2A CCP system outage for planned maintenance.
- Unit 1, November 27, GREEN risk profile associated with "B" train essential chilled water chiller and "B" train NSCW pump no. 2 being OOS for planned maintenance.
- Unit 1, December 19, GREEN risk profile and RMAs associated with NSCW transfer pump being out of service due to 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, past operability determination for the safety injection pumps' suction motor-operated valve (MOV) 8804B due to improper mounting of a close limit switch associated with the valve's open circuit interlock permissive, CR10410863 and TE994253
- Unit 2, immediate operability determination (IDO) for component cooling water (CCW) pump no. 4 due to a lube oil leak on the pump's inboard bearing housing, CR10434015
- Unit 2, operability determination for intermittent high pressure alert on steam generator "B", CR10417574
- Unit 1, operability determination for proportional heaters being inoperable, CR10419349
- Unit 1, operability determination for incorrect size wire being installed on "A" EDG, CR10439003
- Unit 1, IDO of atmospheric relief valve (ARV) 1PV3030 due to debris in hydraulic fluid, CR10440268

b. Findings

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 for post maintenance testing (PMT) of the Namco limit switch on Unit 2 valve 2HV-8920 (SI Pump B Min Flow Line Isolation). As a result, during ECCS interlock testing, valve 2HV-8804B (RHR Pump B to SI Pump B Isolation) failed to open due to 2HV-8920 Namco limit switch being installed improperly. The licensee's failure to perform a PMT on valve 2HV-8920 Namco limit switch following removal and reinstallation, as required by NMP-MA-014-001 (Post Maintenance Testing Guidance), was a performance deficiency.

Description: In March 2010, the actuator for 2HV-8920 (SI Pump B Min Flow Line Isolation Valve) was rebuilt in accordance with work order SNC2080323601. This work order included the removal and reinstallation of the Namco limit switch. However, the work order did not include PMT instructions, as required by NMP-MA-014-001 (Post Maintenance Testing Guidance), to verify proper operation of the reinstalled limit switch. The licensee incorrectly assumed that verification of valve position would ensure proper limit switch operation, but failed to recognize the logic ties of the limit switch and did not test this portion of the switch.

Valves 2HV-8814 and 2HV-8920 ("A" train powered), and 2HV-8813 ("B" train powered) are mini flow valves to the RWST which must be closed to prevent sending the emergency sump contents back out to the RWST during recirculation. In order to isolate

the RWST with these valves, either 2HV-8813 or both 2HV-8814 and 2HV-8920 must be closed before 2HV-8804B will open. During ECCS interlock testing (14715-2) on September 21, 2017, 2HV-8804B failed to open during the logic path II test (section 4.13), which requires both 2HV-8814 and 2HV-8920 to be closed in order to open 2HV-8804B. Upon discovery, the licensee conducted troubleshooting and found that the Namco limit switch for 2HV-8920 was installed improperly, which inadvertently rendered one of the logic inputs for the opening of 2HV-8804B inoperable. The licensee reinstalled the limit switch correctly and performed the interlock testing satisfactory following the corrective maintenance. The issue was entered into the CAP as CR 10410863.

The licensee determined and verified through previous completion of logic path I (section 4.12) that while 2HV-8804B would not have opened due to logic path II being inoperable, it would have still opened because path I (2HV-8813) was still functional and would have performed its function in case of an accident.

Analysis: The licensee's failure to perform a PMT on the Namco limit switch for 2HV-8920 following removal and reinstallation, as required by NMP-MA-014-001 (Post Maintenance Testing Guidance), was a performance deficiency. 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. Specifically, the performance deficiency affected the reliability of the ECCS valve interlock system. The finding was evaluated using 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 logic path II (2HV-8920 and 2HV-8814) for the opening of 2HV-8804B was inoperable, the system maintained its functionality due to the availability of logic path I (2HV-8813). The inspectors determined there was no cross-cutting aspect since the finding is not indicative of current performance.

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," 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 properly preplanned and performed in accordance with written documented instructions and appropriate to the circumstances. Contrary to the above, in March 2010, the licensee failed to implement work instructions nor establish appropriate procedures concerning the PMT of the removed and reinstalled Namco limit switch for 2HV-8920. As result, logic path II for the opening of 2HV-8804B was inadvertently rendered inoperable when maintenance technicians improperly installed the Namco limit switch for 2HV-8920. This violation was entered into the licensee's CAP as CR 10410863. This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. (NCV 05000425/2017004-01, Failure to Implement and Establish Appropriate Work Instructions for PMT of Namco Limit Switch on 2HV-8920)

1R18 Plant Modifications (71111.18)a. Inspection Scope

For the following plant modifications listed below, 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.

Plant Modifications:

- SNC 851150, Emergency Diesel Generator control power "Power Available" light indication re-configuration.
- SNC 639635, Unit 1 NSCW 8" butterfly valve replacement (1HV2261 and 1HV2262)
- 1-DT-12-1202-00404, Unit 1 and 2 NSCW corrosion control isolation

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.

- SNC 412480, Unit 2 "B" train safety injection (SI) pump motor operated valve (MOV) test
- SNC 864572, Unit 2 "2A" CCP system outage
- SNC 126943, Unit 1 "A" train NSCW fan #2 gearbox replacement
- SNC 137670, Unit 2 2HY8811B MOV preventative maintenance
- SNC 904664, Unit 1 "A" train EDG control panel light

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 continued from October 1, 2017, through October 6, 2017, the inspectors evaluated the following outage activities:

- heatup and startup
- reactor coolant system instrumentation and electrical power configuration
- reactivity and inventory control
- decay heat removal and spent fuel pool cooling system operation
- containment closure
- low power physics testing

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 three 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 CAP to verify the licensee was identifying and correcting any testing problems associated with surveillance testing.

Routine Surveillance Tests

- 14627-2, Solid State Protection System Slave Relay k622 Train B Test Containment Isolation, Rev. 9
- 14460-1, Emergency Core Cooling System (ECCS) Flowpath Verification, Rev. 41.1
- 14410-2, Control rod operability test, Rev. 20.1

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (71114.06)a. Inspection Scope

The inspectors observed one emergency preparedness drill conducted on October 24, 2017, and one Drill and Exercise Performance (DEP) training evolution on November 6, 2017. The inspectors observed licensee activities in the simulator and technical support center to evaluate implementation of the emergency plan, including event classification, notification, dose assessment, and protective action recommendations. The inspectors evaluated the licensee's performance against criteria established in the licensee's procedures. Additionally, the inspectors attended the post-exercise critique to assess the licensee's effectiveness in identifying emergency preparedness weaknesses and verified the identified weaknesses were entered in the CAP.

b. Findings

No findings were identified.

2. RADIATION SAFETY (RS)

Cornerstone: Occupational Radiation Safety, Public Radiation Safety Cornerstone

2RS6 Radioactive Gaseous and Liquid Effluent Treatment (71124.06) (Six Inspection Samples Completed)

a. Inspection Scope

Radioactive Effluent Treatment Systems. The inspectors walked down selected components of the gaseous and liquid radioactive waste (radwaste) processing and effluent discharge systems. To the extent practical, the inspectors observed and evaluated the material condition of in-place waste processing equipment for indications of degradation or leakage that could constitute a possible release pathway to the environment. Inspected components included U1 and U2 plant vent particulate, iodine, and gas monitoring systems, radwaste processing vent monitoring system, and U1 and U2 liquid effluent monitoring systems, including associated piping and valves. The inspectors interviewed licensee staff regarding equipment configuration and effluent monitor operation. The inspectors also walked down and reviewed surveillance test records for auxiliary building and control room HEPA / Charcoal HVAC filtration systems.

Effluent Sampling and Discharge. The inspectors reviewed the licensee's program for the collection and processing of liquid and gaseous effluent samples. Technician proficiency in collecting, processing, and preparing the applicable release permits was evaluated. The inspectors reviewed recent liquid and gaseous release permits including pre-release sampling results, effluent monitor alarm setpoints, and public dose calculations. For U1 plant vent post-accident effluent radiation monitors RE-12442 and RE-12444, the inspectors reviewed calibration and functional test records and evaluated traceability of radioactive calibration sources to National Institute of Standards and Technology (NIST) standards. The inspectors also evaluated the licensee's capability to collect high-range post-accident effluent samples from these monitoring systems. The inspectors reviewed licensee methodology for determining vent and stack flow rates and compared current vent flows to design values in the FSAR.

The inspectors reviewed the 2015 and 2016 Annual Radioactive Effluent Reports to evaluate reported doses to the public, reviewed any anomalous events, and reviewed ODCM changes. The inspectors also reviewed compensatory sampling data for time periods when selected radiation monitors were out of service. The inspectors reviewed the results of interlaboratory cross-checks for laboratory instruments used to analyze effluent samples. The inspectors also reviewed licensee effluent source term characterizations and changes to effluent release points. In addition, the inspectors evaluated recent land use census results.

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

Inspection Criteria. Radwaste system operation and effluent processing activities were evaluated against requirements and guidance documented in the following: 10 CFR Part 20; 10 CFR Part 50 Appendix I; ODCM; UFSAR Chapters 7 and 11; Regulatory Guide (RG) 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants"; RG 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50 Appendix I"; and TS Sections 5.5 and 5.6. Documents reviewed during the inspection are listed in the report Attachment.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (REMP) (71124.07) (Three Inspection Samples Completed)

a. Inspection Scope

REMP Implementation. The inspectors reviewed the 2015 and 2016 Annual Radiological Environmental Operating Reports and the 2015 and 2016 Annual Radioactive Effluent Release Reports. Selected environmental measurements were reviewed for consistency with licensee effluent data, evaluated for radionuclide concentration trends, and compared with detection level sensitivity requirements as described in the ODCM. The inspectors assessed the licensee's response to any missed or anomalous environmental samples. The inspectors also reviewed the results of interlaboratory cross-checks for laboratory instruments used to analyze environmental samples. Any changes to the ODCM, Land Use Census, or environmental program processes were discussed with licensee staff.

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

Meteorological Monitoring Program. The inspectors observed the physical condition of the meteorological tower and its instrumentation and discussed equipment operability and maintenance history with licensee staff. The inspectors evaluated transmission of locally generated meteorological data to other licensee groups such as emergency operations personnel and main control room operators. Calibration records for the meteorological measurements of wind speed, wind direction, and temperature were reviewed. The inspectors also reviewed meteorological measurement data recovery for 2015 and 2016.

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

Problem Identification and Resolution. The inspectors reviewed (CAP) documents in the areas of radiological environmental monitoring and meteorological tower maintenance. The inspectors evaluated the licensee's ability to identify and resolve the issues. The inspectors also reviewed recent self-assessment results.

Inspection Criteria. The inspectors evaluated REMP implementation and meteorological monitoring against the requirements and guidance contained in: 10 CFR Part 20; Appendices E and I to 10 CFR Part 50; TS Sections 5.5 and 5.6; Plant Vogtle's ODCM, Rev. 31; UFSAR Chapter 11; RG 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment; Branch Technical Position, "An Acceptable Radiological Environmental Monitoring Program" – 1979; Reg Guide 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants"; NEI 07-07, "Industry Groundwater Protection Initiative – Final Guidance Document;" and approved licensee procedures. Documents reviewed during the inspection are listed in the Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope

Cornerstone: Mitigating Systems

- safety system functional failures (2)
- emergency AC power system (2)
- cooling water system (2)

The inspectors reviewed a sample of the PI data submitted by the licensee, for the Unit 1 and Unit 2 PIs listed above. The inspectors reviewed plant records compiled between October 1, 2016, and September 30, 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.

Cornerstone: Occupational Radiation Safety. The inspectors reviewed the Occupational Exposure Control Effectiveness PI results for the Occupational Radiation Safety Cornerstone from March 2016 through November 2017. For the assessment period, the inspectors reviewed electronic dosimeter alarm logs, RWP set points and CAP documents related to controls for exposure significant areas. Documents reviewed are listed in the Attachment.

Cornerstone: Public Radiation Safety. The inspectors reviewed the Radiological Control Effluent Release Occurrences PI results for the Public Radiation Safety Cornerstone from March 2016 through November 2017. For the assessment period, the inspectors reviewed cumulative and projected doses to the public contained in liquid and gaseous release permits and CAP documents related to Radiological Effluent Technical Specifications/ODCM issues. The inspectors also reviewed licensee procedural guidance for collecting and documenting PI data. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review

The inspectors screened items entered into the licensee’s CAP in order to identify repetitive equipment failures or specific human performance issues for followup. The inspectors reviewed CRs, attended screening meetings, or accessed the licensee’s computerized corrective action database.

.2 Semi-Annual Trend Review

a. Inspection Scope

The inspectors reviewed issues entered in the licensee’s CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on closely-related deficiencies applicable to Units 1 and 2, associated with nuclear service water system (NSCW) motor main power cable termination box installations, but also considered the results of inspector daily CR screenings, licensee trending efforts, and licensee human performance results. The review considered the six-month period of July 2017 thru December 2017, although some examples extended beyond those dates when the scope of the trend warranted. The inspectors compared their results with the licensee’s analysis of trends. Additionally, the inspectors reviewed the adequacy of corrective actions associated with a sample of the issues identified in the licensee’s trend reports. The inspectors also

reviewed corrective action documents that were processed by the licensee to identify potential adverse trends in the condition of structures, systems, and/or components as evidenced by acceptance of long-standing non-conforming or degraded conditions. Documents reviewed included engineering system health reports, CRs, vendor failure analysis, work orders, and narrative logs.

b. Findings

Introduction: A Green, self-revealing, NCV of TS 5.4.1.a, "Procedures," was identified for the licensee's failure to properly implement and establish procedures to maintain watertight requirements of the nuclear service water system (NSCW) pumps' motor main power cables termination box. As a result, the Unit 2 "B" train NSCW pump no. 4 breaker automatically opened (tripped) due to a phase-to-ground fault caused by water and moisture intrusion into the power cable splice connections. Failure to adequately implement and establish procedures to maintain watertight requirements of the NSCW pump's motor main power cables termination box during maintenance, as required by maintenance procedures and specifications, was a performance deficiency.

Description: On August 16, 2017, Unit 2 operators commenced a routine NSCW "B" train pump swap. At 10:44 a.m. operators placed pump no. 4 in service and shut down pump no. 6. Approximately 15 minutes after pump no. 4 was placed in service, the motor's power supply breaker tripped due to actuation of "C" phase overcurrent and ground relays.

The NSCW pumps are subject to mild environment conditions; they are located inside the NSCW force-draft cooling towers and are subject to wind-carried rain droplets, condensation, and water splashing from roof plugs immediately above the pumps. Accordingly, the motor's power cable terminations and splices are specified to be enclosed in a NEMA Type 4 (NEMA 4) enclosure or "motor termination box" (MTB), which, in part, provides protection with respect to harmful effects due to ingress of water (e.g. rain, sleet, snow, splashing water). Initial inspection of the MTB identified standing water at the bottom of the box and water droplets on the interior box surfaces. Causal and forensics analyses determined the direct cause of the motor trip was a phase-to-ground fault on the 4160-volt "C" phase resulting from water and moisture intrusion into the MTB. Inspection and disassembly of the power cable terminator fitting and MTB identified several issues that disqualified the MTB's NEMA 4 rating. Specifically, moisture and water was able to enter the MTB due to the terminator fitting not being installed per vendor instructions, via unsealed threads on bushings used to install the terminator fitting, and through two half-inch holes identified in one side of the MTB. Once inside the water migrated into the spliced power cable connection and caused a phase-to-ground fault.

NSCW pump no. 4 motor was last worked on August 2016 under maintenance work order (MWO) SNC765405. The inspectors noted MWO SNC765405 did not provide any instructions to inspect and ensure the replacement motor's MTB met the required NEMA

4 qualification rating, similar to instructions that would normally be provided when installing new or modifying existing MTBs per maintenance procedure 25008-C, "Flexible and Rigid Conduit Installation," Ver. 18. The implementing MWO failed to provide adequate instructions to verify the MTB installation was per specification X3AR01-E8 (i.e., NEMA 4).

Following the 2B NSCW pump no. 4 failure, the licensee took corrective actions to replace the motor and faulted cable. The licensee took compensatory measures to apply sealant on all identified moisture intrusion locations at the MTB-to-terminator interface and plugged the two holes on the side of the MTB. Also, an extent of condition identified the design change had been implemented in all Unit 2 NSCW pumps and pumps no. 1 and no. 5 on Unit 1. Compensatory actions were also taken to seal MTB-to-terminators on those affected pumps. Additionally, the licensee inspected all affected Unit 2 NSCW pumps to verify water intrusion was not a concern until permanent corrective actions were implemented, which included re-splicing all motor connections and full restoration of the NEMA 4 enclosure. Interim corrective actions to open and inspect affected Unit 1 pumps (two pumps – no. 1 and no. 5) were in "Plan" status at the end of the inspection period. Review of the latest water intrusion PMs for affected Unit 1 pumps and external inspection of the MTB "t-drains" did not indicate evidence of water intrusion. This issue was entered in the licensee's CAP as CRs 10399125, 10404327, and CAR 270905.

Analysis: The licensee's failure to adequately implement and establish procedures to maintain watertight requirements of the NSCW pumps' motor main power cables termination box during maintenance, as required by maintenance procedures and specifications, was a performance deficiency. 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 (e.g., core damage). Specifically, the performance deficiency resulted in water and moisture intrusion into NSCW motor termination splices; a condition that would affect the reliability of the NSCW system pumps, as evidenced by the phase-to-ground fault failure of the Unit 2 NSCW pump no. 4 on August 16, 2017. Using Exhibit 2 of IMC 0609, Appendix A, the inspectors determined that this finding was of very low safety significance (Green) because, although the performance deficiency affected the qualification and operability of the NSCW pump no. 4, 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 hours. Specifically, the performance deficiency only impacted the operability of one of three NSCW pumps in the "B" train with two pumps required for train operability. The finding was assigned a cross-cutting aspect of "Resources," because procedures and/or work instructions were not available, in August 2016, to maintenance personnel for properly verifying Unit 2 NSCW pump no. 4 MTB was installed in compliance with NEMA 4 specifications. (H.1)

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 properly preplanned and performed in accordance with written documented

instructions appropriate to the circumstances. Contrary to the above, since August 2009, the licensee failed to implement and establish procedures to ensure that NSCW motor termination boxes meet NEMA Type 4 requirements during maintenance (i.e., during installation and modifications to the MTB). As result, the “watertight” feature of the MTB was compromised and allowed water and moisture to entrain the motor termination splice of Unit 2 NSCW pump no. 4, causing a phase-to-ground fault that rendered the pump inoperable. This violation was entered into the licensee's CAP as CR10399125, 10404327, and CAR270905. This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. (NCV 0500424/2017004-02, 05000425/2017004-02, Failure to Maintain NEMA Type 4 Qualification for the Nuclear Service Cooling Water Pumps).

.3 Annual Sample Review

a. Inspection Scope

The inspectors conducted a detailed review of CR 829367 and CR 10374135, associated with testing of ECCS recirculation flow paths with potential leakage to atmospheric vented tanks.

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 CRs
- completion of corrective actions in a timely manner

b. Findings

One LIV was identified and documented in Section 4OA7 of the report. No additional findings were identified.

While observing and reviewing ECCS check valve in-service testing (IST) during Unit 2 refueling outage (2R19) the inspectors noted isolation valves in ECCS recirculation lines to the refueling water storage tank (RWST) were being tested as ASME OM Code Category B (i.e., seat leakage inconsequential for fulfillment of their safety function) instead of Category A where seat leakage is limited to a specific amount for fulfillment of their safety function. The inspectors reviewed licensee actions associated NRC information Notice (IN) 91-56, “Potential Radioactive Leakage to Tanks Vented to Atmosphere,” which alerted the industry about a generic vulnerability regarding the possibility for highly radioactive water leaking into vented tanks, such as the RWST, during ECCS sump recirculation due to tank pipe line isolation valves not being identified as having a ‘leak tight’ safety function (e.g., Category “A”) and thus not being tested for leak tightness. This could result in unmonitored releases during and following postulated design bases accidents and exceed maximum evaluated control room and offsite dose

limits. Additionally, it noted that 10 CFR 50.55a(g), which references ASME OM code, required valves with seat leakage limited functions be tested as Category A valves. The licensee's evaluation of the IN was captured in requests for engineering assistance (REAs) VG-3041 and VG-1747. Potential leak paths back to the RWST during ECCS recirculation mode were identified and the maximum back-leakage was quantified primarily based on procurement specification design values for valve seat leakage and existing test acceptance criteria. The calculated back-leakage was evaluated for additional radiological dose impact on control room habitability (10 CFR 50 App A, GDC 19), site exclusion area, and low population zone limits (10 CFR 100.11) and determined to be insignificant. Inspectors noted no additional actions were taken at the time to establish acceptable leakage values nor periodic IST of the valves to periodically validate performance within acceptable limits.

In December 2014, the licensee re-evaluated their actions in response to IN 91-56 as a result from a finding at a sister plant. The licensee identified the need to periodically leak test leakage paths identified in VG-3041. Additionally, it identified two leak paths not previously identified. These issues were captured in the licensee's CAP under CR 829367 and technical evaluation (TE) 886122, and additional actions were created to analyze and determine an acceptable aggregate amount of back-leakage to the RWST (TE 966251) and to incorporate these limits into periodic IST leak test surveillances for valves in affected leak paths (TE 966252). The inspectors verified these actions were being tracked and expected to be completed in accordance with the licensee's CAP.

4OA5 Other Activities

.1 (Closed) Licensee Event Report 05000424/2016-003-00; 05000425/2016-003-00: Tornado Missile Vulnerabilities Result in Condition Prohibited by Technical Specifications

a. Inspection Scope

On October 26, 2016, the licensee identified non-conforming conditions in the plant as-built configuration and condition such that specific TS equipment on both units were considered to not be adequately protected from tornado missiles as required by the current design and licensing basis. Specific vulnerabilities included:

- Condensate storage tank (CST) vents not having adequate protection;
- Exhaust vents for the turbine-driven auxiliary feed water (TDAFW) pump not having adequate protection; and
- Steam generator atmospheric relief valves (ARVs) extended above the roof of the main steam valve rooms and not providing adequate protection.

The licensee entered various TS action statements for the SSCs. Operability was restored promptly using the guidance in Interim DSS-ISG-2016-01, "Clarification of Licensee Actions in Receipt of Enforcement Discretion," per NRC Enforcement Guidance Memorandum 15-002, "Enforcement Discretion for Tornado-Generated Missile Protection Non-Compliance," dated February 2016. The inspectors noted that the licensee has maintained the compensatory measures per the listed guidance while continuing to correct the non-conforming conditions.

A list of specific SSCs adversely effected and discussed in the LER included:

- Unit 1 and Unit 2 TDAFW Exhaust;
- Unit 1 and Unit 2 CSTs;
- Unit 1 and Unit 2 Main Steam Safety Valves Exhaust;

The inspectors reviewed the LER to ensure it was reported accurately in accordance with Title 10 of the *Code of Federal Regulations*, (10 CFR) Part 50.73 reporting requirements. This LER is closed.

b. Findings

A finding and an associated violation of 10 CFR Part 50, Appendix B, Criterion XI, "Corrective Action," was previously identified and documented in NRC IR 05000424/2016007; 05000425/2016007 (ADAMS Accession No. ML16358A672). Because the finding and violation were identified during the discretion period covered by Enforcement Guidance Memorandum 15-002, Revision 0 and Revision 1 and, because the licensee had implemented interim corrective actions and has final corrective actions planned, the NRC exercised enforcement discretion by not issuing an enforcement action.

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

a. Inspection Scope

The inspectors performed a walkdown of the onsite ISFSI on December 19, 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.

.3 Onsite Fabrication of Components and Construction of an Independent Spent Fuel Storage Installation (60853)

a. Inspection Scope

The inspectors conducted a review of licensee and vendor activities in preparation for the concrete placement for the second section of the first large Independent Spent Fuel Storage Installation (ISFSI) pad outside of the Protected Area. The licensee will use the HI-STORM (Holtec International Storage Module) FW (Flood and Wind) System. The inspectors walked down the construction area of the ISFSI pad and examined the rebar installation, for compliance to licensee-approved drawings, specifications, procedures, and applicable codes, the Certificate of Compliance (COC), and TS. The inspectors also

evaluated the concrete formwork installation for compliance to the licensee-approved drawings. The inspectors interviewed licensee and contract personnel to verify knowledge of the planned work. The inspectors also observed the actual concrete placement for the second section of the ISFSI slab, and observed testing and sample collection by the independent laboratory to verify that the work was implemented according to approved specifications and procedures. The inspectors later returned to the newly constructed pad to verify that it was being cured according to approved specifications and Code requirements. Later, when the 7-day and 28-day compression tests were completed by the independent laboratory, the inspectors reviewed the results to verify that the acceptance criteria were met. The inspectors noted that all tested samples satisfied the acceptance criteria.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On January 17, 2018, the resident inspectors presented the inspection results to Mr. Dom Sutton 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.

Title 10 CFR 50.55a(f), "Inservice testing requirements," subsection (4) required, in part, that pumps and valves which are classified as ASME Class 1, Class 2, and Class 3 must meet the inservice test requirements set forth in the ASME OM Code. The ASME Code of record for Vogtle for Operation and Maintenance of Nuclear Power Plants (OM) is the 2004 edition through 2006 addendum. Subsection ISTC-1300, "Valve Categories," required in part, that valves within this subsection shall be placed in one or more of the following categories. Category "A" is for valves for which seat leakage is limited to a specific maximum amount in the closed position for fulfillment of their required function(s), as specified in ISTA-1100. Contrary to the above, since 1991, the licensee did not categorize valves in ECCS recirculation flow paths to the RWST as Category "A" valves to ensure the ASME OM test requirements were met by leak testing the valves to demonstrate that their seat leakage would limit the consequences of an accident to control room operators and to the public at the site boundary per Title 10 CFR Part 100 limits. The inspectors determined this finding was of very low safety significance (Green) because the issue would only have the potential to represent a degradation of the radiological barrier function provided for the control room. This issue was documented in the licensee's CAP as CR 829367 and TE 886122.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:

T. Baker, Security Manager
D. Komm, Plant Manager
E. Berry, Engineering Director
J. Dixon, Radiation Protection Manager
T. Fowler, Chemistry Manager
D. Sutton, Regulatory Affairs Director
T. Krienke, Operations Director
D. Myers, Site Vice-President
I. White, Licensing Supervisor
K. Walden, Licensing Engineer
M. Williams, RP Superintendent
J. Sutton, Acting Chemistry Manager
M. Williams, RP Superintendent
L. Beasley, Chemistry Supervisor

NRC personnel:

Alan Blamey, Chief, Reactor Projects Branch 2

LIST OF REPORT ITEMS

Opened and Closed

05000425/2017004-01	NCV	Failure to Implement and Establish Appropriate Work Instructions for PMT of Namco Limit Switch on 2HV-8920 (1R15)
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05000424 and 0500425/2017004-02	NCV	Failure to Maintain NEMA Type 4 Qualification for the Nuclear Service Cooling Water Pumps (4AO2)
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Closed

05000424/2016-003-00	LER	Tornado Missile Vulnerabilities Result in Condition Prohibited by Technical Specifications (4OA5)
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05000425/2016-003-00	LER	Tornado Missile Vulnerabilities Result in Condition Prohibited by Technical Specifications (4OA5)
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LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

11877-1, Cold Weather Checklist, Ver. 22.1
11877-2, Cold Weather Checklist, Ver. 22.1
11901-2, Heat Tracing System Alignment, last reviewed 10/2/17
11901-2, Heat Tracing System Alignment, last reviewed 11/21/17
NMP-GM-025, Site Certification Letter for Winter Period, Signed 11/15/17

Drawings

1X4DB133-1, P&I Diagram Rev. 54.0, Nuclear Service Cooling Water System, Sys. No. 1202
1X4DB133-2, P&I Diagram Rev. 54.0, Nuclear Service Cooling Water System, Sys. No. 1202
1X4DB161-1, P&I Diagram Rev. 46.0, Auxiliary Feedwater System, System No. 1302
1X4DB161-2, P&I Diagram Rev. 28.0, Auxiliary Feedwater System, System No. 1302
1X4DB161-3, P&I Diagram Rev. 42.0, Auxiliary Feedwater System, System No. 1302
2X4DB133-1, P&I Diagram Rev. 54.0, Nuclear Service Cooling Water System, Sys. No. 1202
2X4DB133-2, P&I Diagram Rev. 54.0, Nuclear Service Cooling Water System, Sys. No. 1202

Section 1R04: Equipment Alignment

Procedures

20411-C, Control of Lubricants, Ver. 18

Drawings

2X4DB116-1, Ver. 49.0, P&I Diagram – Chemical and Volume Control System – Sys. No. 1208
2X4DB116-2, Ver. 32.0, P&I Diagram – Chemical and Volume Control System – Sys. No. 1208

Other

System Health Report for Unit 1 – 1302A, Auxiliary Feedwater System (1st Qtr. – 2016 to 3rd Qtr. 2017)
Tagout 1-DT-17-2403-00364, 12403P5DG2, EDG 1A Engine Control Panel Modification
Tagout 1-ET-17-2403-00155, Protect equipment due to 1A DG being inoperable
Tagout 2-DT-17-1208-00209, CVCS 2B CCP Outage
Tagout 2-OP-17-1208-00143, 2HV8111B, 2B CCP min-Flow Isolation MOV outage tagout
Tagout 2-OP-17-1208-00144, 2HV8509A, 2B CCP min-Flow Isolation MOV outage tagout

Condition Reports generated during the inspection:

10425245, ECCS 2A CCP reservoir oil level out of specification low

Section 1R05: Fire Protection Annual/Quarterly

Procedures

92840A-2 Rev. 3.0, Zone 140A – Cntmt Bldg. – Levels A, B, 1, 2, and 3 Fire Fighting Preplan
92840B-2 Rev. 4.0, Zone 140B – Cntmt Bldg. – Levels A, B, 1, 2, and 3 Fire Fighting Preplan
92840C-2 Rev. 2.0, Zone 140C – Cntmt Bldg. – Levels A, B, 1, 2, and 3 Fire Fighting Preplan
92840E-2 Rev. 1.0, Zone 140E – Cntmt Bldg. – Levels A, B, 1, 2, and 3 Fire Fighting Preplan
92845-2, Rev. 0.2, Zone 145 – NSCW Cooling Tower 2A Mechanical and Electrical Tunnels
2T2A, 2T3A, and 2T5A Fire Fighting Preplan

92846-2, Rev. 1.0, Zone 146 – NSCW Cooling Tower 2B Mechanical and Electrical Tunnels
 2T2B, 2T3B, and 2T5B Fire Fighting Preplan
 96860A-2, Rev 1.2, Zone 160A – NSCW Pump House – Train A Fire Fighting Preplan
 96860B-2, Rev 1.2, Zone 160B – NSCW Pump House – Train B Fire Fighting Preplan

Section 1R06: Flood Protection Measures

Procedures

NMP-ES-051-004, Pull Box Inspection Procedure, Ver. 5.1

CAP Records

CR 10314218, High voltage switchyard pull box has three feet of water
 CR 10314218, Three feet of water found in 1NE9GHKEPB01, 1/4/17
 CR 10361960, Six feet of water found in 1NE9GHKEPB01, 5/5/17
 CR 10449368, Fire inches feet of water found in 1NE9GHKEPB01, 1/12/18
 CR 10361920, Solar powered pump for 1NE9GHKEPB01 not working, 5/5/17
 CR 10304996, Solar powered pump for 1NE9GHKEPB01 not working, 12/5/16

Work Orders

SNC 831491, Investigate/repair solar pump for 1NE9GHKEPB01
 SNC 777810, Pull box and manhole water intrusion inspection, 10/6/16
 SNC 784055, Pull box and manhole water intrusion inspection, 11/20/16
 SNC 788569, Pull box and manhole water intrusion inspection, 11/20/16
 SNC 791566, Pull box and manhole water intrusion inspection, 12/5/16
 SNC 797819, Pull box and manhole water intrusion inspection, 12/29/16
 SNC 800841, Pull box and manhole water intrusion inspection, 1/13/17
 SNC 808787, Pull box and manhole water intrusion inspection, 2/23/17
 SNC 812700, Pull box and manhole water intrusion inspection, 3/11/17
 SNC 815117, Pull box and manhole water intrusion inspection, 3/24/17
 SNC 817820, Pull box and manhole water intrusion inspection, 4/7/17
 SNC 823128, Pull box and manhole water intrusion inspection, 5/5/17
 SNC 825905, Pull box and manhole water intrusion inspection, 6/12/17
 SNC 831120, Pull box and manhole water intrusion inspection, 6/18/17
 SNC 876196, Pull box and manhole water intrusion inspection, 12/20/17
 SNC 879763, Pull box and manhole water intrusion inspection, 1/16/18

Section 1R11: Licensed Operator Requalification Program and Licensed Operator

Performance

Procedures

112004-C, Power Operation, Ver. 119.3
 12002-2, Unit Heatup to Normal Operating Temperature and Pressure, Ver. 1.0
 12003-2, Reactor Startup (mode 3 to mode 2), Ver. 2.0
 14005-2, Shutdown Margin and Keff Calculations, Ver. 22.0
 18001-C Primary Systems Instrumentation Malfunction, Ver. 37.1
 18004-1 Reactor Coolant System Leakage, Ver. 30.1
 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-DP-001-002, Reactor Startup Risk Assessment

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-17501, As-Found Segment 20174, Ver. 1.0

Section 1R12: Maintenance Effectiveness

Procedures

NMP-ES-027-001, Maintenance Rule Implementation, Ver. 8
 NMP-AD-002, Problem Solving and Troubleshooting Guidelines, Ver. 12.0
 NMP-GM-002-001, CAP Instructions, Ver. 34.0
 21000-2, NSCW Cooling Tower A Train Narrow Range Basin Level 2L-1606 Channel Calibration, Ver. 4.0
 17003-2 Annunciator Response Procedures for ALB 03 on Panel 2A1 on MCB, Rev. 17.1
 SLC 03190, NSCW Bubbler Tube Rodding/Drilling Out, Rev. 1.0

Drawings

2X5DT0122, Level Setting Diagram NSCW CT Basin Train A & B, Rev. 3

CAP Records

CR 10082582, U2 train B NSCW level transmitter failed
 CR 10085902, Unit 1 AMSAC froze during surveillance
 CR 10309043, Unit 2 AMSAC surveillance failed Voter and Output relay test
 CR 10309062, Evaluation of compensatory actions for AMSAC being in bypass
 CR 10379647, U2 NSCW B basin reading high
 CR 10414037, U2 AMSAC surveillance failed logic test
 CR 10415721, Unit 2 AFW turbine trouble alarm
 CR 10419704, Unit 2 AFW turbine trouble alarm
 CR 10431130, Unexpected control room alarm for 2B NSCW tower basin level Hi/Lo
 CR 10431130, Unexpected control room alarm for 2B NSCW tower basin level Hi/Lo
 CR 824941, Unit 1 AMSAC surveillance testing could not be completed
 CR 861937, 2L1607 NSCW B Tower basin level prompt rise of approx. 2.3%

Corrective Action Report

CAR 271502, ERC for TDAFW power supply failure

Technical Evaluations

TE 981612, MR Evaluation for Unit 1 AMSAC freezing during surveillance
 TE 995738, MR Evaluation for U2 AMSAC surveillance failed logic test
 TE 995774, MR Eval for U2 AFW Trouble
 TE 995998, MPFF Evaluation for U2 TDAFW power supply failure
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 SNC 907757, Unexpected control room alarm received ALB03-C01 NSCW train B cooling tower basin Hi/Lo level, 11/16/17
 SNC 133402, Rod/Drill out NSCW Bubbler tube for 2L-1607, 7/13/2011

SNC 495718, Rod/Drill out NSCW Bubbler tube for 2L-1607, 12/2/2015
 SNC 392680, 2B NSCW Tower Basin 2L-1607 Channel Calibration, 3/28/2016
 SNC 876405, Unit 2 NSCW tower basing high level/investigate, 6/17/17
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 PMCR 90238, Increase frequency NSCW rodding/drilling PM of level indication bubbler from 36
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Section 1R13: Maintenance Risk Assessments and Emergent Work Control

Procedures

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 NMP-GM-031-001, Online Maintenance Rule (a)(4) Risk Calculations, Ver. 3.0

Other

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 1-DT-17-1592-00308, 1B ESF Chiller Water System Outage
 Unit 1, Phoenix Integrated Risk Report, November 27, 2017
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Section 1R15: Operability Determinations and Functionality Assessments

Procedures

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Drawings

2X3D-BD-D02B, Elementary Diagram, Safety Injection System – 2-HV-8920, Rev. 6
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 2X3D-BD-D02M, Elementary Diagram, Safety Injection System – 2-HV-8804B, Rev. 6
 2X3D-BD-D03B, Elementary Diagram, Safety Injection System – 2-HV-8813, Rev. 6
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 2X4DB122, P&I Diagram, Residual Heat Removal System No. 1205, Rev. 54

CAP Records

CR 10332821, Inboard pump oil bubbler low
 CR 10375005, U2 CCW pump 4 needs oil added to inboard bubbler
 CR 10410863, 14715-2 Section 4.13 Failed
 CR 10412192, 2HV8920 Namco limit switch found mounted incorrectly
 CR 10423091, Oil addition for unit 2 CCW no. 4
 CR 10428653, U2 CCW pump 4 needs oil addition
 CR 10431950, U2 CCW pump no. 4 inboard oil level low
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Work Orders

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SNC 397225, 1204 2HV8813-MO B-train SI pump mini-flow static votes test and PM, 9/15/14

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SNC 639635, Unit 1 NSCW 8" butterfly valve replacement (1HV2261 and 1HV2262)

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1X4DB192-1, P&I Diagram, Nuclear Service Cooling Water Chem Injection System & Chlorine Analysis System No. 1413, Rev. 21.0

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CR 520212, NSCW corrosion racks impact on ultimate heat sink

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CR 10440933, Inadequate 50.59 screening for isolating NSCW corrosion monitors greater than 90 days

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SNC 904664, Implementing WO for DECP to replace/relocate bulb (ZL-4674/4675), 12/12/17

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Procedures

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25719-C, Electrical Integrity and Configuration Control, Ver. 24.1
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Work Orders

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SNC137670, Unit 2 2HY8811B MOV preventative maintenance
SNC412480, Unit 2 "B" train safety injection (SI) pump motor operated valve (MOV) test
SNC864572, Unit 2 '2A' CCP system outage
SNC904664, Unit 1 "A" train EDG control panel light

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Procedures

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33015-2, Obtaining Gaseous Samples for Radioactivity Analysis (Unit 2), Ver. 25

36015-OEMS, Radioactive Liquid Effluent Release Permit Generation and Data Control Computer (OpenEMS) Method, Ver. 10.1

36020-OEMS, Radioactive Gaseous Effluent Release Permit Generation and Data Control Computer (OpenEMS) Method, Ver. 8.2

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