



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
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ATLANTA, GEORGIA 30303-1257

August 9, 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 05000424/2018002 AND
05000425/2018002**

Dear Mr. Myers:

On June 30, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Vogtle Electric Generating Plant, Units 1 and 2. On July 16, 2018, the NRC inspectors discussed the results of this inspection with Mr. Daniel Komm 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. Two 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.

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; and the NRC resident inspector at the Vogtle Electric Generating Plant, Units 1 and 2.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement 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.

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
License Nos.: NPF-68 and NPF-81

Enclosure:
Inspection Report 5000424/2018002
and 05000425/2018002

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SUBJECT: VOGTLE ELECTRIC GENERATING PLANT – NUCLEAR REGULATORY
 COMMISSION INTEGRATED INSPECTION REPORT 05000424/2018002 AND
 05000425/2018002 August 9, 2018

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 50-424, 50-425

License Numbers: NPF-68, NPF-81

Report Numbers: 05000424/2018002; and 05000425/2018002

Enterprise Identifier: I-2018-002-0036

Licensee: Southern Nuclear Operating Company, Inc.

Facility: Vogtle Electric Generating Plant, Units 1 and 2

Location: Waynesboro, GA 30830

Inspection Dates: April 1, 2018 through June 30, 2018

Inspectors: M. Endress, Senior Resident Inspector
A. Alen, Resident Inspector
S. Sanchez, Senior Emergency Preparedness Inspector
C. Fontana, Emergency Preparedness Inspector
T. Morrissey, Senior Resident Inspector
J. Hamman, Resident Inspector

Approved By: A. Blamey, Chief
Reactor Projects Branch 2
Division of Reactor Projects

Enclosure

SUMMARY

The NRC continued monitoring the licensee’s performance by conducting a quarterly inspection at Vogtle Electric Generating Plant Units 1 and 2 in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC’s program for overseeing the safe operation of commercial nuclear power reactors. Refer to <http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/index.html> for more information. NRC and self-revealed findings, violations, and additional items are summarized in the table below.

List of Findings and Violations

Failure to Adequately Load Emergency Deisel Generator (EDG) During 24-Hour Endurance Test			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000424/2018002-01 Opened/Closed	[H.9] – Training	71152 - Problem Identification and Resolution
An NRC-identified Green NCV of Vogtle Nuclear Station TS, Section 5.4.1.a, “Procedures,” was identified for the licensee’s failure to implement the EDG 24-hour endurance surveillance procedure 14668A-1, “Train A Diesel Generator Operability Test,” revision 7.2, to operate the EDG as close as practicable to 3390 kVAR. Specifically, the licensee failed to carry out procedure steps and provisions that would assist in loading the EDG closer to the TS value of 3390 kVAR. The failure to follow procedure 14668A-1 and get as close as practicable to 3390 kVAR was a performance deficiency.			

High Vibrations on Unit 2 NSCW Pump No. 3 Result in Pump Inoperability			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000424/2018002-02 Opened/Closed	[H.6] – Design Margins	71152 - Problem Identification and Resolution
An NRC-identified Green NCV of 10 CFR 50 Appendix B, Criterion III, “Design Control,” was identified for the licensee’s failure to ensure that design control measures for the Unit 2 train ‘A’ (2A) nuclear service cooling water (NSCW) pump no. 3 motor replacement, conducted in May 2015, adequately evaluated and addressed structural resonance of the pump, commensurate with the original pumps. As a result, the pump operated at higher than desired vibrations, since installation, causing accelerated bearing wear and premature failure of the motor in February 2018. The licensee’s failure to ensure that design control measures for the 2A NSCW pump no. 3 motor replacement adequately evaluated and addressed structural resonance of the pump, commensurate with the original pumps was a performance deficiency.			

PLANT STATUS

Unit 1 operated at or near 100 percent rated thermal power (RTP) for the entire inspection period.

Unit 2 operated at or near 100 percent RTP for the entire inspection period.

INSPECTION SCOPES

Inspections were conducted using the inspection procedure (IP) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met. The inspectors performed plant status activities described in Inspection Manual Chapter (IMC) 2515 Appendix D, "Plant Status" and conducted routine reviews using IP 71152, "Problem Identification and Resolution." The inspectors used the Commission's rules and regulations as the criteria for determining compliance along with established licensee standards as the criteria for assessing licensee performance.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Summer Readiness (1 Sample)

The inspectors evaluated summer readiness of offsite and alternate alternating current (AC) power systems.

71111.04 - Equipment Alignment

Partial Walkdown (4 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Unit 2 'B' train electric switchgear and motor control center (MCC) room emergency safety feature (ESF) cooler due to the 'A' train out of service (OOS) for planned maintenance on April 3, 2018
- (2) Unit 2 'A' train 125 VDC chargers while 'C' train charger was OOS for load testing on April 12, 2018
- (3) Unit 2 'A' train emergency diesel generator (EDG) while the 'B' train EDG was OOS for planned maintenance on April 17, 2018
- (4) Unit 1 offsite power sources to 'A' 4160V bus with the 'A' EDG OOS for a planned maintenance outage on May 6, 2018

Complete Walkdown (1 Sample)

The inspectors evaluated system configurations during a complete walkdown of the Unit 1 'B' train EDG while the 'A' train EDG was OOS for planned preventative maintenance outage from May 1 to May 4, 2018.

71111.05 - Fire Protection Annual/Quarterly

The inspectors evaluated the following:

Quarterly Inspection - 71111.05Q (6 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Unit 1 lower cable spreading room, fire zones 94, 95, 173, and 174
- (2) Unit 1 upper cable spreading room, fire zones 107, 108, 120, and 121
- (3) Unit 1 Level A 4.16kV switchgear and remote shutdown rooms, fire zones 91, 92, 97, 98, and 103
- (4) Unit 2 train 'A' and 'B' control room filter and chiller rooms, fire zones 125B and 126B
- (5) Unit 1 fuel handling building levels A/B/C, fire zones 15, 27, 29, and 132
- (6) Unit 2 fuel handling building levels A/B/C, fire zones 15, 27, 29, and 132

71111.11 - Licensed Operator Requalification Program and Licensed Operator Performance

Operator Requalification (1 Sample)

The inspectors observed and evaluated a simulator scenario administered to an operating crew on May 21, 2018. The scenario V-RQ-SE-2018301, consisted of an inadvertent turbine runback followed by a small reactor coolant system leak requiring a plant shutdown. While preparing to shut down the reactor, additional equipment issues resulted in a reactor trip and large break loss of coolant accident requiring safety injection.

Operator Performance (2 Samples)

The inspectors observed and evaluated operator performance in the main control room during a Unit 2 'A' train NSCW Pump 3 in-service test on April 2, 2018, and during a Unit 1 EDG operability test on June 25, 2018.

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness (1 Sample)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

- (1) Units 1 NSCW transfer pump maintenance rule performance criteria exceeded (condition report (CR) 10448554)

71111.13 - Maintenance Risk Assessments and Emergent Work Control (6 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) Unit 2, GREEN risk profile for NSCW Pump no. 3 and steam dumps out of service (OOS) due to emergent issue on April 10, 2018.
- (2) Unit 2, GREEN risk profile for NSCW Pump no. 3, CCW pump no. 4, and 'B' train EDG OOS from April 16-18, 2018.
- (3) Unit 1, Risk Informed Completion Time (RICT) risk management activities (RMAs) for 'A' train EDG extended preventative maintenance outage on May 2, 2018.
- (4) Unit 1, YELLOW risk profile for 'A' train extended preventative maintenance outage on May 4, 2018.
- (5) Unit 1, RICT RMAs for 'B' train EDG extended preventative maintenance outage on June 15, 2018.
- (6) Unit 1, YELLOW risk profile for 'B' train extended preventative maintenance outage on June 18, 2018.

71111.15 - Operability Determinations and Functionality Assessments (5 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Unit 2, deficient fan motor sleeve for Unit 2 electrical switchgear and MCC room, on April 3, 2018, CR10478565 and CR10478899
- (2) Unit 1, Immediate determination operability (IDO) for steam leak on 1HV-15199 (auxiliary feed water outlet check valve) on April 6, 2018, CR10479554
- (3) Unit 2, IDO for reactor coolant pump no. 3 high level alarm on lube oil reservoir, on April 21, 2018, CR10484993
- (4) Unit 2, Sequencer A trouble alarm and troubleshooting, on May 3, 2018, CR10488896
- (5) Unit 2, Prompt determination operability (PDO) for Auxiliary Feed Water (AFW) greater than expected flow rates, on May 11, 2018, CR1041383

71111.18 - Plant Modifications (2 Samples)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Unit 2, NSCW Homewood Motor Calming Mass 2-1202-P4-003-M01, SNC930749
- (2) Unit 2, NSCW pump motor no. 3 Homewood motor replacement, SNC620017

71111.19 - Post Maintenance Testing (5 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) SNC593316, Unit 2 'A' train ESF room cooler and electrical switchgear and MCC room on April 4, 2018
- (2) 14802A-1, Unit 1 'A' NSCW pump and discharge valve test on April 9, 2018, after pump and valve routine maintenance under SNC598119 and SNC811858
- (3) SNC897076, Unit 2 'B' train EDG lube oil heat exchanger leak repair on April 18, 2018

- (4) GEN 95 Chapter 48 and 14980A-2, Unit 1 'A' EDG functional and operability test on May 10, 2018, following extended preventative maintenance outage
- (5) SNC760680, Unit 1 Containment Escape Airlock Seal Repair and Local Leak Rate Test on June 2, 2018

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (3 Samples)

- (1) 14643-2, Unit 2 SSPS slave relay K641 Train 'B' test for AFW, on April 19, 2018
- (2) 14606-1, Unit 1 Slave Relay K618 Train 'A' Test Safety Injection on April 13, 2018
- (3) 14908B-2, Unit 2 Train B EDG fast start operability run, on May 21, 2018

In-service Test (IST) (1 Sample)

- (1) 14802-A, Unit 2 NSCW Train 'A' IST, on May 10, 2018

EMERGENCY PREPAREDNESS

71114.01 - Exercise Evaluation (1 Sample)

The inspectors evaluated the biennial emergency plan exercise during the week of May 14, 2018. The exercise scenario simulated a turbine trip as an anticipated transient without a reactor trip, followed by a loss of coolant accident inside containment and loss of power to the 1BA03 electrical bus. A steam generator fault inside containment, followed by containment depressurization via a failed containment penetration, got the site to a General Emergency classification so that the offsite organizations could demonstrate their ability to implement emergency actions.

71114.04 - Emergency Action Level and Emergency Plan Changes (1 Sample)

The inspectors evaluated submitted Emergency Action Level and Emergency Plan changes during the week of May 14, 2018. This evaluation does not constitute NRC approval.

71114.08 - Exercise Evaluation – Scenario Review (1 Sample)

The inspectors reviewed and evaluated in-office, the proposed scenario for the biennial emergency plan exercise at least 30 days prior to the day of the exercise.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification (7 Samples)

The inspectors verified licensee performance indicators submittals listed below for the period from April 1, 2017, through March 31, 2018, for both Units 1 and 2.

- (1) BI01: Reactor Coolant System Specific Activity (2 Samples)
- (2) BI02: Reactor Coolant System Leak Rate (2 Samples)

The inspectors verified licensee performance indicators submittals listed below for the period from April 1, 2017, through December 31, 2017, for both Units 1 and 2.

- (3) EP01: Drill & Exercise Performance (1 Sample)
- (4) EP02: Emergency Response Organization Drill Participation (1 Sample)
- (5) EP03: Alert & Notification System Reliability (1 Sample)

71152 - Problem Identification and Resolution

Semiannual Trend Review (1 Sample)

The inspectors reviewed the licensee’s corrective action program for trends that might be indicative of a more significant safety issue. The inspectors identified and reviewed an adverse trend associated with the loading of the emergency diesel generators (EDGs) as close as practical to design bases reactive load requirements during 24-hour endurance tests.

Annual Follow-up of Selected Issues (1 Sample)

The inspectors reviewed the licensee’s implementation of its corrective action program related to the following issue:

- (1) Condition Report 10466720, Unit 2 nuclear service water pump (NSCW) no. 3 declared inoperable due to a step change increase in pump motor vibrations.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

60855.1 - Operation of an Independent Spent Fuel Storage Installation

The inspectors evaluated the licensee’s independent spent fuel storage installation cask loadings on May 24-25, 2018.

INSPECTION RESULTS

Failure to Adequately Load EDG During 24-Hour Endurance Test			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000424/2018002-01 Opened/Closed	[H.9] – Training	71152 - Problem Identification and Resolution
An NRC-identified Green NCV of Vogtle Nuclear Station TS, Section 5.4.1.a, “Procedures,” was identified for the licensee’s failure to implement the EDG 24-hour endurance surveillance procedure 14668A-1, “Train A Diesel Generator Operability Test,” revision 7.2, to operate the EDG as close as practicable to 3390 kVAR. Specifically, the licensee failed to implement procedure steps and provisions that would assist in loading the EDG closer to the TS value of 3390 kVAR. The failure to follow procedure 14668A-1 and get as close as practicable to 3390 kVAR was a performance deficiency.			

Description: The 24-hour endurance test for the EDGs demonstrate the machine's long-term operational readiness to assume the design basis accident (DBA) loads. Operation at these conditions heats the electric conductors and magnetic frame in the machine and demands maximum output from support systems.

During the week of February 4, 2018, the inspectors observed portions of the 1A EDG 24-hour endurance test in accordance 14668A-1, "Train A Diesel Generator Operability Test," revision 7.2. This surveillance was conducted every 18 months to satisfy Technical Specification (TS) Surveillance Requirement (SR) 3.8.1.13, which required, in part, that the licensee verify each EDG operates for 24 hours as close as practicable to 3390 kVAR, while maintaining voltage at the '1E' 4160V bus less than or equal to 4330V. This reactive loading (3390kVARs) is representative of the actual inductive loading that the EDG would experience during DBA conditions.

The inspectors reviewed the test results, following completion of the test on February 6, 2018, and noted that the reactive loading on the 1A EDG was maintained at approximately one-third (1150-1250 kVAR) of the TS required loading for the duration of the test. Procedure 14668A-1 Step 5.1.11.b required the operators to establish reactive load as close to 3390 kVAR as possible, while maintaining a bus voltage of less than 4326V. After achieving kVARs as close to 3390, while maintaining 4326V or less, the procedure has operators verify that the voltage at the downstream 480V AC switchgear buses is less than 506V. If voltage is greater than 506V the procedure provided the operators with the following three actions to restore voltage within limits. (1) adjusting kVARs (i.e. by lowering generator output voltage), (2) placing more loads on the '1E' 480V switchgear, and (3) requesting the system controller to lower grid voltage.

The inspectors noted that the operators only performed the first action (adjust kVARs) during the test and marked the other two as 'not applicable' (N/A). The inspectors determined that not conducting actions (2) and (3) first before simply lowering generator voltage, and consequently kVARs, was not consistent with establishing a reactive load as close as practicable to 3390 kVAR. Placing more loads on the '1E' 480V AC switchgear and requesting system controller to lower grid voltage, if possible, would reduce the 480V switchgear bus voltage to less than 506V and allow for a higher kVAR loading on the EDG. These actions would be consistent with the procedure in order to satisfy the "as close as practicable" TS requirement. The inspectors also noted that operators logged a maximum voltage of 4300V during the 24-hour surveillance and did not attempt to go higher, closer to the TS limit, in order to maximize reactive load.

The inspectors also determined that the use of less accurate instrumentation on the EDG control board in the main control room versus the more accurate and readily available readings from the integrated plant computer (IPC) limited the operators from attaining a reactive load closer to 3390 kVAR. The inspectors communicated their concerns to the licensee and the concerns were captured in the corrective action program as condition report 10462412. On February 19, 2018, the licensee conducted another scheduled 24-hour endurance surveillance on the 1B EDG. This time the operators implemented all procedural measures, to attain the required reactive load which resulted in a reactive load much closer to the TS value.

The inspectors conducted a review of the last four 24-hour endurance surveillances for each EDG to determine how the licensee had historically conducted the test with respect to attaining, as close as practicable, the design basis reactive load. The inspectors noted that

the reactive load, on only a few instances, was close to the 3390 kVAR TS requirement. For the majority of the surveillances the kVAR loading ranged between 500 to 2000 kVARs with the steps listed in section 4.1.14.d marked as N/A and did not use IPC instrumentation.

Corrective Action(s): The licensee entered these issues in their corrective action program to provide operator training on 'as close as practicable' expectations to achieve the required reactive load. The licensee also revised the EDG surveillance procedures to include better guidance and clarification of the requirements for kVAR loading.

Corrective Action References: CRs 10462412, 10475251, 10516149, and 10518082.

Performance Assessment:

Performance Deficiency: The failure to fully implement procedure 14668A-1 and get as close as practicable to 3390 kVAR was a performance deficiency.

Screening: The Performance Deficiency (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 the licensee not detecting an issue with the EDG that would prevent it from running with a full load for the required time during accident conditions. In addition, this PD was identified for multiple test performances on all four EDGs at the site.

Significance: The inspectors assessed the significance of the finding using Exhibit 2, "Mitigating Systems Screening Questions," of Inspection Manual Chapter (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 the performance deficiency affected the qualification of the EDG, but the EDG maintained its operability and functionality. The licensee performed an evaluation and determined it had reasonable assurance that the EDGs were operable and able to perform their safety function.

Cross-cutting Aspect: The finding was assigned a cross cutting aspect of "Training", because the licensee did not ensure they had a knowledgeable, technically competent workforce regarding the loading requirements for the EDG 24-hour endurance run. The licensee entered this issue into their CAP and conducted training with all operators on the EDG loading requirements and TS requirements for the EDG 24-hour endurance run. (H.9)

Enforcement:

Violation: 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 implemented. Appendix A, Item 8 required, in part, that specific procedures for surveillance tests should be written for Emergency Power Tests.

Contrary to the above, on February 6, 2018, the licensee failed to properly implement the 1A EDG 24-hour operability test. Specifically, the licensee failed to control kVAR as close as practicable to 3390 while maintaining 4326V or less by utilizing steps given in the procedure.

Disposition: This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy.

High Vibrations on Unit 2 NSCW Pump No. 3 Result in Pump Inoperability			
Cornerstone	Significance	Cross-cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000425/2018002-02 Opened/Closed	[H.6] – Design Margins	71152 - Problem Identification and Resolution
<p>Introduction: An NRC identified Green NCV of 10 CFR 50 Appendix B, Criterion III, “Design Control,” was identified for the licensee’s failure to ensure that design control measures for the Unit 2 train ‘A’ (2A) nuclear service cooling water (NSCW) pump no. 3 motor replacement, conducted in May 2015, adequately evaluated and addressed structural resonance of the pump, commensurate with the original pumps. As a result, the pump operated at higher than desired vibrations, since installation, causing accelerated bearing wear and premature failure of the motor in February 2018.</p>			

Description: The ultimate heat sink for each unit 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. Between January 12, 2018, and February 27, 2018, the licensee experienced a rapid increasing trend of motor vibrations for the 2A NSCW pump no. 3. The pump had been under increased monitoring since its motor was replaced in May 2015, due to elevated vibrations. On January 12, vibrations at the motor upper perpendicular test point were at 0.32 inches per second (ips). On February 9, vibrations increased to 0.51 ips and on February 27, 2018 they increased to 0.66 ips. With the in-service test (IST) required Action limit at 0.7 ips, the licensee declared the pump inoperable because it did not have reasonable assurance the pump would be capable of performing its safety function for its 30-day mission time. This issue was entered into the licensee’s corrective action program (CAP) under corrective action report (CAR) 273164 to conduct a causal analysis evaluation.

The licensee determined the cause of the motor failure was due to internal loosening caused by continued operation at elevated vibrations. Additionally, since installation in 2015 the motor’s rotational speed was near the pump-motor structure natural frequency (NF). Motor internal loosening led to unbalancing of the motor and shifted the motor-pump NF response closer to the motor’s rotational speed. This resulted in elevated resonance vibration, causing accelerated bearing wear and potential damage. Rotational speed near a pump-motor structure NF amplifies normal equipment vibration and will result in damaging vibration levels.

The 2A NSCW pump no. 3 motor was procured in 2014, as a spare NSCW motor, to facilitate refurbishment of all NSCW pump motors. The motor was not a ‘like-for-like’ replacement and required engineering evaluation to ensure it met the requirements of the original motors. New motor differences included changes in motor weight, dimensions, cooling line connections, center of gravity, electrical performance, seismic qualification, etc. Additionally, an initial evaluation of the new motor-pump NF response identified it was 2.7-percent (%) below the motor operating speed. Historical data for the NSCW pumps showed that vibrations were generally acceptable when the NF was more than 5% below the motor rotational speed. The new motor would need installation of a calming mass to achieve an acceptable separation margin. The licensee evaluated the acceptability of the new motor under configuration change evaluation (CCE) SNC620017. The evaluation determined the motor could only be installed at the 2A NSCW pump no. 3 without adding a calming mass. This pump was unique in that its discharge piping had welded stiffeners that were expected to result in acceptable NF to rotational speed separation margins. Specifically, NF response analysis predicted the NF would be 11% above the motor rotational speed at this pump location. The inspectors

noted that the post-installation vibration and NF test results identified higher than desired vibrations at the motor upper perpendicular direction. Also, NF testing confirmed the vibrations were due to structural resonance. Specifically, NF response was just 3.8% above the motor rotational speed, significantly lower than expected and within the 5% margin historically acceptable for the original NSCW pumps. The NF and vibration test report documented recommendations to resolve the resonant conditions; however, the pump was restored to service at the higher than desired vibrations without addressing the resonant condition based on vibration limits being just below the IST Alert levels (0.325ips at the bearing housing) at 0.3ips. The inspectors noted the as-left motor vibrations exceeded the maximum coupled and uncoupled permissible vibrations limits specified in the documented vendor technical manual, 2X4AF02-00236, "NSCW Pump Motor Unit 2 NSCW Pump 3 Instruction Manual and Renewal Parts List," version 1.0. Specifically, the maximum permissible vibration on the motor housing, uncoupled, was 0.2 ips; measured vibrations were at 0.25 ips. Maximum permissible vibration while coupled and fully loaded was 0.3ips; measured vibrations were at 0.38 ips. Additionally, the inspectors noted that two weeks after the pump was returned to service the IST vibration levels had exceeded the IST Alert limits at 0.359ips. The pump remained under increased vibration monitoring until it failed after 33 months in service, approximately 16,000 hours of operation.

The inspectors determined the licensee failed to adequately evaluate the NF to motor rotational speed margin for the new motor against historical operating experience with the original NSCW motors. This was required by the licensee's CCE Contents Form, NMP-ES-084-001-F20 section A.7. Specifically, this section required documentation of applicable internal and external experience, including the mitigation strategy incorporated into the modification to ensure similar events would not occur. The as-left separation margin wasn't just less than what had been historically acceptable for the original NSCW pumps, it was also in the 'positive' direction (i.e., above the motor rotational speed instead of below). This was non-conservative because normal equipment wear would naturally lower the NF closer to the motor rotational speed as the equipment becomes less stiff over time. Additionally, this low margin in combination with elevated vibrations did not demonstrate that vibrations would remain acceptable over the full range of design conditions, such as, lower pump suction water levels, higher water temperatures, and emergency diesel generators alternating power (AC) frequency allowances during accident conditions which could narrow the separation margin to unacceptable levels.

Corrective Action(s): The licensee refurbished the 2A NSCW pump motor no. 3 and implemented a design change that added a calming mass atop of the motor. This provided a NF to motor rotational speed margin of approximately 11% and reasonably lower and acceptable vibration levels. The pump was returned to service on May 7, 2018.

Corrective Action Reference(s): CAR 273164

Performance Assessment:

Performance Deficiency: The licensee's failure ensure design control measures for the 2A NSCW pump no. 3 motor replacement, in May 2015, adequately evaluated and addressed structural resonance of the pump, commensurate with the original pumps was a performance deficiency.

Screening: The performance deficiency was more than minor because it adversely affected the reliability of the Unit 2 NSCW system. Furthermore, the pump remained out-of-service for approximately 2 months for motor repairs and design changes.

Significance: The inspectors assessed the significance of the finding using Exhibit 2, "Mitigating Systems Screening Questions," of Inspection Manual Chapter (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 although the performance deficiency affected the operability of the Unit 2 NSCW pump no. 3, it did not result in an actual loss of safety system function, and it did not represent a loss of function of more than one train for more than its TS allowed outage time or greater than 24 hours.

Cross-cutting Aspect: The finding was assigned a cross cutting aspect of "Design Margins", because the licensee did not maintain acceptable NF to motor rotational speed separation margins. (H.6)

Enforcement:

Violation: 10 CFR 50 Appendix B Criterion III, Design Control, required, in part, that design changes shall be subject to design control measures commensurate with those applied to the original design.

Contrary to the above, since replacement of the 2A NSCW pump no.3 motor in May 2015, the licensee failed to subject the U2 NSCW pump no. 3 motor replacement to design control measures commensurate with those applied to the original motors. Specifically, design control measures for the replacement motor did not ensure sufficient separation between the motor-pump NF and the operating speed of the motor, commensurate with the original NSCW motors, to prevent a resonant condition. As a result, high vibrations resulted in accelerated bearing wear and premature failure of the motor in February 2018.

Disposition: This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On July 16, 2018, the inspectors presented the quarterly resident inspector inspection results to Mr. Daniel Komm, and other members of the licensee staff.

DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

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
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
10029-C, NERC/SERC Standards for Generator Operators, Ver. 3.0

Other

Site Certification Letter for Summer Readiness dated May 1, 2018

Section 1R04: Equipment Alignment

Procedures

11881-2, Auxiliary Building Rounds Sheet
11405-2, 125V DC 1E Electrical Distribution System Alignment, Rev. 6.1
14230-1, Offsite AC Circuit Verification and Capacity/Capability Evaluation, Rev. 27
13145A-1 Diesel Generator Train A – Checklist 1 Train A Diesel Generator Standby Mode Status Check, Ver. 10

Drawings

2X4DB170-2, Ver. 44.0, Unit 2 P&I Diagram – Diesel Generator System Train B
2X4DB217, Ver. 15.0, Unit 2 P&I Diagram – Diesel Generator System Building HVAC System
2X4DB107-1, Ver. 6.0, Unit 2 P&I Diagram – Control Logic Diagram Diesel Generator Fuel Oil Sys
2X4DB107-2, Ver. 5.0, Unit 2 P&I Diagram – Control Logic Diagram Diesel Generator Unit Engine
2X4DB107-3, Ver. 2.0, Unit 2 P&I Diagram – Control Logic Diagram Diesel Generator Excitation
2X4DB107-4, Ver. 0.0, Unit 2 P&I Diagram – Control Logic Diagram Diesel Generator Engine Auxiliaries
2X4DB107-5, Ver. 1.0, Unit 2 P&I Diagram – Control Logic Diagram Diesel Generator Engine Auxiliaries
2X4DB228, Ver. 15, Unit 2 P&I Diagram – Engineered Safety Feature Room Coolers – System 1555
2X3D-BG-D05E, Ver. 7.0, Elementary Diagram – ESF Room Coolers System 2-1555-A7-005 & 011-M01
2X3D-BA-H03B, Ver. 2, Elementary Diagram Electrical System 125V DC SWGR. Incoming Breaker 2CD106

Corrective Action Program Records

Condition Reports (CRs)

10359424, 10357197, 10440885, 10484659, 10344441, 10355884, 10356853

Work Orders

SNC862561, SNC858819, SNC913403

Other

Emergency Diesel Generator Systems 2403, 1st Quarter 2017
Tagout 2-DT-18-1555-00061, 2A electrical switchgear and MCC room ESF cooler
Tagout 2-DT-18-1806-00069, Unit 2 'C' train charge 'Alpha' (2CD1CA) load test and calibration

Tagout 2-OP-18-1806-00027, 1E DC SWGR @CD1 125V Battery Charger (b/C) 2CD1CA
Unit 1 EDGs System Health Reports Q2-2017 and Q4-2017

Section 1R05: Fire Protection Annual/Quarterly

Procedures

29100-C, Portable Fire Extinguishers and Fire Hose Stations Visual Inspection, Version 62.11
92040-C, Fire Protection Operability and LCO Requirements, Rev. 46.0
92715-1, Zone 15, FHB Pipe Penetration Room Fire Fighting Preplan Rev. 3.1,
92715-2, Zone 15, FHB Pipe Penetration Room Fire Fighting Preplan, Rev. 1.1
92727-1, Zone 27, Fuel Handling Building – Level B Fire Fighting Preplan, Rev. 1.2
92727-2, Zone 27, FHB – Level B, Access Tunnel Corridor Fire Fighting Preplan
92729-1, Zone 29, FHB – Levels B, A, and 1 Electrical Chase – Train B Fire Fighting Preplan,
Rev. 3.1
92729-2, Zone 29, FHB – Levels B, A, and 1 Electrical Chase – Train 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
92794-1, Zone 94 Control Building Level A Fire Fighting Preplan, Rev. 3.0
92795-1, Zone 95 Control Building Level A Fire Fighting Preplan, Rev. 4.0
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. 4.0
92803-1, Zone 103 Control Building Level A Fire Fighting Preplan, Rev. 3.0
92807-1, Zone 107 Control Building Levels 1 and 2 Fire Fighting Preplan, Rev. 5.1
92808-1, Zone 108 Control Building Levels 1 and 2 Fire Fighting Preplan, Rev. 5.1
92820-1, Zone 120 Control Building Level 2 Fire Fighting Preplan, Rev. 7.0
92821-1, Zone 121 Control Building Level 2 Fire Fighting Preplan, Rev. 5.0
92832-1, Zone 132 – FHB – Level A Fire Fighting Preplan, Rev. 6.1
92832-2, Zone 132 – FHB – Level A, SFPHX & Pipe Pen. Fire Fighting Preplan, Rev. 2.1
92873-1, Zone 173 Control Building Level A Fire Fighting Preplan, Rev. 2.2
92874-1, Zone 174 Control Building Level A Fire Fighting Preplan, Rev. 2.2

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

Completed Procedures

14802A-2, Train A NSCW Pump/Check Valve IST and Response Time Test, Section 5.4,
conducted April 2, 2018

Procedures

19000-1, E-0 Reactor Trip or Safety Injection, Ver. 2.2
19010-1, E-1 Loss Reactor or Secondary Coolant, Ver. 1.1
18007-C, Chemical and Volume Control System Malfunction, Ver. 26.1
18004-C, Reactor Coolant System Leakage, Ver. 30.2
NMP-EP-141-003-F01, Vogtle Unit 1 and Unit 2 – HOT Initiating Condition Matrix, Ver. 1.0
NMP-EP-141-003, Vogtle Unit 1 and Unit 2 Emergency Action Levels and Basis, Ver. 3.0
NMP-EP-142-F01, Emergency Notification Form (ENF), Ver. 1.0

Other

V-RQ-SE-18301, As-Found/DEP Scenario, Ver. 1.1

Corrective Action Program Records

Condition Reports (CRs)

10497804, Simulator crew failure, 5/27/18

Condition Reports generated from Inspection

10481800, NSCW IST procedure precondition steps in section 5.4, 4/12/18

Section 1R12: Maintenance Effectiveness

Procedures:

NMP-ES-027, Maintenance Rule Program, Ver. 7

Procedures

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

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

Work Orders

SNC854052, B-NSCW XR IST-Q, 11/6/17

SNC836413, B-NSCW XR IST-Q, 8/14/17

Corrective Action Program Records

Condition Reports (CRs)

10448554, Unit 1 NSCW Transfer Pump Maintenance Rule Performance Criteria Exceeded

10442216, Unit 1 NSCW Pump 7 bracket weld

10438767, Water intrusion in heater junction box

10304938, Unit 1 NSCW Transfer Pump no. 7 Repairs

10331579, Oil Level Low

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 Control

Procedures

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

13419-C, Diesel Generator RICT Support, Ver. 10.0

Other

Unit 2 Phoenix Integrated Risk Report for April 10, 2018

Unit 2 Narrative Control Room Logs for April 10, 2018

Unit 2 Daily Work Schedule for April 10, 2018

Unit 2 Phoenix Integrated Risk Reports between April 14 - 16, 2018

Unit 2 Narrative Control Room Logs between April 14-16, 2018

Unit 2 Daily Work Schedule for April 14 - 16, 2018

Unit 1 Phoenix Integrated Risk Report for May 2, 2018

Unit 1 Narrative Control Room Logs for May 2, 2018

Unit 1 Daily Work Schedule for May 2, 2018

Unit 1 Phoenix Integrated Risk Report for May 4, 2018

Unit 1 Narrative Control Room Logs for May 4, 2018

Unit 1 Daily Work Schedule for May 4, 2018

Unit 1 Phoenix Integrated Risk Report for June 15, 2018

Unit 1 Narrative Control Room Logs for June 15, 2018

Unit 1 Daily Work Schedule for June 15, 2018
Unit 1 Phoenix Integrated Risk Report for June 18, 2018
Unit 1 Narrative Control Room Logs for June 18, 2018
Unit 1 Daily Work Schedule for June 18, 2018
1A EDG RICT Implementation for May 2 – May 4, 2018
1B EDG RICT Implementation for June 15 – June 18, 2018
Phoenix RICT Report for RICT# 2018-01, 1A EDG AOT (Opened between 4/28/2018 at 0453 and 5/10/2018 at 0428)
Phoenix RICT Report for RICT# 2018-02, 1B EDG AOT (Opened between 6/9/2018 at 0434 and 6/19/2018 at 0440)

Condition Reports generated from Inspection

10515858, NRC observation for updating Phoenix, 7/16/18

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

NMP-AD-012, Operability Determinations and Functionality Assessments, Ver. 13.1
NMP-OS-014-003 VNP Time Critical Operator Action Program Version 3.1
19020-1 /2, E-3 Steam Generator Tube Rupture Version 3
17036-2, Annunciator Response Procedures for ALB36 on EAB Panel, Ver. 20

Corrective Action Program Records

Condition Reports (CRs)

10413839, 10488896

Other

Standing Order 2-2017-7 Version 1.0
Request for Engineering Evaluation SNC896732 Sequence No. 01

Section 1R18: Plant Modification

Design Change Packages

SNC930749, Rev. 2.0, NSCW Homewood Motor Calming Mass 2-1202-P4-003-M01
SNC620017, Ver. 7.0, NSCW Pump Motor Replacement

Procedures

NMP-ES-084-001, Plant Modification and Configuration Change Processes, Ver. 4.0
NMP-ES-084-001-F20, Configuration Change Evaluation (CCE) Contents Form, Ver. 3.0

Other

2X4AF02-00229, NSCW Pump Motor Unit 2 Pump 3 Motor Data Sheet, Ver. 1.0
2X4AF02-00231, NSCW Pump Motor Unit 2 Pump 3 Motor Load Test Report, Ver. 1.0
2X4AF02-00236, NSCW Pump Motor Unit 2 Pump 3 Instruction Manual and Renewal Parts List, Ver. 1.0
X4AF02, Specification for NSCW Pumps and Transfer Pumps for VEGP Units 1 and 2, 9/16/93
Purchase Order No. SNG38646-0001
Southern Company Generation Maintenance & Reliability Report, NSCW Motor Replacement Evaluation, November 2014
NEMA MG1, National Electric Manufacturers Association, 1972, Motors and Generators

Section 1R19: Post Maintenance Testing

Procedures

13126-C, Containment Personnel Airlock and Escape Hatch Operation, Ver.3.1
25238-C, Escape Airlock Maintenance, Ver. 17.0
14980B-2, Diesel Generator 2B Operability Test, Ver. 29
GEN-95 Chapter no. 48, Diesel Generator Surveillance Manual –GEN-95 Operation of Engine
Ver. 25

Completed Procedures

25238-C, Escape Airlock Maintenance, Ver.3.1, completed on 6/2/2018
14980B-2, Diesel Generator 2B Operability Test, completed on 4/18/2018
14802A-1, Train A NSCW Pump/Check Valve IST and Response Time Test, completed on
4/9/18
14980A-1, Diesel Generator 1A Operability Test, completed May 10, 2018

Corrective Action Program Records

Condition Reports (CRs)

CR10500009, CTB Escape Lock Door opened
CR10475841, 2B EDG lube oil heat exchanger lube oil leak 3/26/18
CR10454520, Oil leak on end bell of lube oil heat exchanger
CR10478688

Technical Evaluations (TEs)

TE1014128, U1 Escape Airlock Seal Protrusion

Work Orders

SNC654969, SNC696447, SNC696453, SNC848434, SNC811858, SNC699447, SNC696453

Other

Tagout 1-DT-18-1202-00083, Unit 1 NSCW pump no. 3 motor/breaker and discharge valve
maintenance
Tagout 2-DT-18-1555-00061, ESF Room Coolers train 'A' electrical switchgear and MCC room
cooler

Section 1R22: Surveillance Testing

Completed Procedures

14802A-2 Version 12, Train A NSCW Pump Check Valve 1ST and Response Time Test,
Completed May 10, 2018
14980B-2, Diesel Operability Test (Section 5.2, Fast Start and Loading), completed May 21,
2018
14606-1, Unit 1 Slave Relay K618 Train 'A' Test Safety Injection on April 13, 2018

Corrective Action Program Records

Condition Reports (CRs)

10491997, 10490230, 10490240

Drawings

1X3D-AA-K01A, Ver. 8.0, One Line Diagram – Diesel Generators 1A & 1B Relays and Meters
1X3D-BH-G03H, Ver. 15.0, Elementary Diagram – Diesel Engine Control – Diesel Engine-
Generator DG1A

1X3D-BH-G03J, Ver. 7, Elementary Diagram – Diesel Engine Control – Diesel Engine-Generator DG1A

1X3D-BH-G03G, Ver. 7, Elementary Diagram – Diesel Engine Control – Diesel Engine-Generator DG1A

Other

LCO/TR Status Sheet LCO/TR Number 2-2018-018i

ASME OM Code, Subsection ISTB, Inservice Testing of Pumps in Light-Water Reactor Nuclear Power Plants, 2004 Edition with Addenda through OMB-2006

Unit 2 Diesel Generator Start Log No. 002338

Unit 1 Engineering Logs between May 6-7, 2018

Section 40A1: Performance Indicator (PI) Verification

Procedures, Guidance Documents, and Manuals

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

Unit 1 and Unit 2 Narrative Logs (eSOMS) between April 1, 2017 and March 31, 2018

Unit 1 and Unit 2 Chemistry Results for RCS Filtrate DEI ($\mu\text{Ci}/\text{mL}$) between April 1, 2017 and March 31, 2018

Records and Data

DEP opportunities documentation for 2nd, 3rd, & 4th quarters 2017

Siren test data for 2nd, 3rd, & 4th quarters 2017

Drill & exercise participation records of ERO personnel for 2nd, 3rd, and 4th quarters 2017

Corrective Action Program Documents

CR 10433806, Error message on training server for WebEOC

CR 10477124, Check-in self-assessment deficiency

Section 40A2: Problem Identification and Resolution

Procedures

14668A-1, Train A Diesel Generator 24 Month Operability Test, Rev. 1

14668A-1, Train A Diesel Generator 24 Month Operability Test, Rev. 2

14668A-1, Train A Diesel Generator Operability, Ver. 9.0

14668B-1, Train B Diesel Generator Operability, Ver. 7.2

Corrective Action Program Records

Condition Reports (CRs)

10070663, 2A NSCW pump PMT vibrations in the Alert Range

10077080, 2A NSCW pump PMT vibrations in the Alert Range

161475, Exceeded 506V limit on 480V SWGR during 24-hr EDG Run

2006100686, RER review for EDG 24-hr surveillance and operating as close as practical to 3390kVAR

10518082, Impact evaluation of KVAR testing on EDGs

Corrective Action Report (CARs)

255614, Newly purchased spare NSCW motor not evaluated by design engineering prior to PO issuance

257771, 2A NSCW Pump 3 in IST Alert Range

264423, 2A NSCW Pump 3 close to exceeding the IST Alert Range

273164, ERC for 2A NSCW Pump No. 3 Declared Inoperable due to High Vibrations, 4/25/2018

Technical Evaluation (TE)

922115, TE to resolve high vibrations on NSCW pump 3

Other

ASME OM Code, Subsection ISTB, Inservice Testing of Pumps in Light-Water Reactor Nuclear Power Plants, 2004 Edition with Addenda through Omb-2006

Cynthia D. Pederson, U.S. Nuclear Regulatory Commission DRS Director, letter to Catherine Haney U.S. Nuclear Regulatory Commission NRR/DLPM Deputy Director, August 29, 2005, Agency wide Document Access and Management System (ADAMS) Accession No. ML052580444.

LCV-1329, Vogtle Electric Generating Plant Request to Revise TS Diesel Generator Loading Requirements Surveillance Requirements 3.8.1.3 and 3.8.1.13, May 18, 1999

LTAM V-16-0167, Long Term Action Plan for NSCW High Vibrations, initiated 7/29/2016

Michael J. Case, U.S. Nuclear Regulatory Commission, letter to Cynthia D. Pederson, U.S. Nuclear Regulatory Commission, July 11, 2007, Agency wide Document Access and Management System (ADAMS) Accession No. ML071700770.

NRC Information Notice 91-13, Inadequate Testing of Emergency Diesel Generators Regulatory Guide 1.108, Rev. 1, August 1977, Periodic Testing of the Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants.

Regulatory Guide 1.9, Rev. 3, July 1993, Selection Design, Qualification, and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants.

Repair Shop Job No. 850988, Homewood Motor SN: 2EM10229

Southern Company Generation Maintenance & Reliability Report, NSCW Motor Replacement Vibration Analysis, November 2015

Temporary Instruction 2515/176, Emergency Diesel Generator Technical Specification Surveillance Requirements Regarding Endurance and Margin Testing, dated 05/16/08

Unit 2 NSCW Pump No. 3 Inservice Testing Vibration Data between May 2015 through February 2018

Work Orders

1A EDG 18-month 24hr Surveillance

SNC839165 (February 2018)

SNC687096 (July 2016)

SNC546950 (March/2015)

SNC420626 (October 2013)

1B EDG 18-month 24hr Surveillance

SNC888629 (February 2016)

SNC693187 (August 2016)

SNC550751 (June 2015)

SNC425801 (October 2013)

2A EDG 18-month 24hr Surveillance

SNC751976 (May 2017)

SNC590049 (November 2015)

SNC459933 (May 2014)

SNC361771 (October 2012)

2B EDG 18-month 24hr Surveillance

SNC794504 (December 2017)

SNC620947 (December 2015)
SNC462382 (July 2014)
SNC364448 (December 2012)

Section 1EP1: Exercise Evaluation

Procedures

NMP-EP-140, Accident Assessment, Ver. 1.0
NMP-EP-141, Event Classification, Ver. 1.1
NMP-EP-141-003, Vogtle 1 & 2 Emergency Action Levels & Basis, Ver. 3.0
NMP-EP-142, Emergency Notification, Ver. 2.0
NMP-EP-143, Facility Activation, Ver. 2.1
NMP-EP-144, Protective Actions, Ver. 3.0
NMP-EP-146, Emergency Response Organization, Ver. 1.0
NMP-EP-147, Offsite Dose Assessment, Ver. 2.0
NMP-EP-303, Drill and Exercise Standards, Ver. 18.0
NMP-EP-303-F05, Drill and Exercise Objectives, Version 3
NMP-GM-002, Corrective Action Program, Ver. 14.4
NMP-GM-002-001, Corrective Action Program Instructions, Ver. 36.2
Southern Nuclear Operating Company Standard Emergency Plan, Ver. 2
Standard Emergency Plan Annex for Vogtle Electric Generating Plant Units 1 and 2, Ver. 2

Records and Data

Vogtle Electric Generating Plant, Emergency Preparedness, NRC/FEMA Evaluated Exercise, May 15, 2018, Exercise Controller Book
Control Room Simulator, Operations Support Center, Technical Support Center, and Emergency Operations Facility/Joint Information Center - Documentation packages (logs, Event Notification Forms, Protective Action Recommendations, Media Releases, and Radiological Dose Assessments)

Corrective Action Program Documents (Condition Reports)

CR 10493972, During the graded exercise on 5/15/18, operators incorrectly applied RCP criteria during a LOCA
CR 10494031, NRC Form 361 was not completed in an adequate manner
CR 10494123, The PA system in the OSC did not function as required
CR 10494139, Announcements were hard to hear in the TSC back room area
CR 10494165, Enhancements needed for NMP-EP-147 for Dose Analyst
CR 10494167, Enhancements needed for NMP-EP-142
CR 10494168, Corporate FMT Communicators were not able to communicate w/ Vogtle FMTs using the Kenwood radios
CR 10494169, Enhancements needed for NMP-EP-147-F06
CR 10494170, 10 mile EPZ map used for FMT control contains a reference point H31 but should be M31
CR 10494171, Enhancements needed for NMP-EP-147-001 on FMT communications
CR 10494172, The PARs Fast-Breaker flowchart has rad monitor tag names but needs noun names and/or descriptions to aid in evaluating fast-breaker
CR 10494173, Need detailed Vogtle site maps for Field Monitoring Teams
CR 10494208, Ops needs to review the proficiency of personnel performing CR ENS & ENN functions
CR 10494210, Challenges with assessing plant conditions for dose assessment as to whether the release pathway was filtered or unfiltered

- CR 10494212, Enhancements to NMP-EP-141-003 to add clarity to help differentiate between unisolable pathway from containment & RCS leakage outside containment
- CR 10494213, No expectation to periodic back calculations using Field Monitoring Team data to confirm dose assessment model assumptions
- CR 10494216, Drill Objective A.1 evaluated as unsatisfactory
- CR 10494221, Drill guidance is needed on how to plan for & document potential incorrect actions
- CR 10492225, The desired flow reading for plant vent flow was not modeled as desired in the simulator
- CR 10494227, Generic TSC issues
- CR 10494233, Guidance for facility critique in NMP-EP-303-F01 is confusing
- CR 10494311, Failure to recognize PAGs were exceeded on follow-up dose projection report
- CR 10494317, Near miss in meeting 15 minute notification of GE & PAR
- CR 10494439, Critique comments indicate an improvement opportunity exists for improving the speed to develop onsite protective actions
- CR 10494446, NMP-EP-147 does not give direction to periodically run back calculations using FMT data
- CR 10494455, Establish target times for PAR determination & notification
- CR 10494458, NMP-EP-303, Drill & Exercise Standards enhancement
- CR 10494476, Evaluate relocating the OSC to the cafeteria
- CR 10494952, NMP-EP-147-001-F01 expectations for location of survey should be clarified
- CR 10495720, Personnel filling role of NRC ENS communicator should be more knowledgeable of operational items (NRC-identified)
- CR 10495722, Onsite dose assessors were not effectively engaged (NRC-identified)
- CR 10495813, Inconsistencies between approved SNC press releases & those provided to NRC for review (NRC-identified)
- CR 10496624, EOF dose assessment team failed to perform back calculations using FMT data

Section 1EP4: Emergency Action Level and Emergency Plan Changes

Procedures

- NMP-EP-310-F01, 10 CFR 50.54(q) Screening, Ver. 5.0
- NMP-EP-310-F03, 10 CFR 50.54(q) Evaluation, Ver. 1.0
- Southern Nuclear Operating Company Standard Emergency Plan, Ver. 2.0
- Standard Emergency Plan Annex for Vogtle Electric Generating Plant Units 1 and 2, Ver. 2.0

Change Packages

- FLT-17-025-00, 10 CFR 50.54(q) Screening for NMP-EP-141-003 "Vogtle 1 and 2 Emergency Action Levels and Basis (NEI 99-01 Revision 6)" Version 3.0, NMP-EP-003-F01 "Hot wallchart" Version 1.0 and NMP-EP-141-003-F-02 "Cold wallchart" Ver. 1.0, dated 1/26/18
- FLT-17-025-00, 10 CFR 50.54(q) Evaluation for NMP-EP-141-003 "Vogtle 1 and 2 Emergency Action Levels and Basis (NEI 99-01 Revision 6)" Version 3.0, NMP-EP-003-F01 "Hot wallchart" Version 1.0 and NMP-EP-141-003-F-02 "Cold wallchart" Ver. 1.0, dated 1/26/18
- FLT-17-025-01, SNC Standard Emergency Plan, Ver. 2.0, 10 CFR 50.54(q) Screening, dated 12/15/17
- FLT-17-025-01, SNC Standard Emergency Plan, Ver. 2.0, 10 CFR 50.54(q) Evaluation, dated 12/18/17
- FLT-18-003-02, NMP-EP-144, Protective Actions, Ver. 3.0, 10 CFR 50.54(q) Screening, dated 2/13/18
- FLT-18-010-01, NMP-EP-141, Event Classification, Ver. 1.1, 10 CFR 50.54(q) Screening, dated 3/29/18

VEGP-17-016-01, Standard Emergency Plan – VEGP Annex, Ver. 2.0, 10 CFR 50.54(q)
Screening, dated 12/14/17
VEGP-17-016-01, Standard Emergency Plan – VEGP Annex, Ver. 2.0, 10 CFR 50.54(q)
Evaluation, dated 12/15/17

Corrective Action Program Documents

CR 10495817, Administrative improvement opportunities for 50.54(q) documentation (NRC-identified)

Section: 1EP8 Exercise Evaluation

Procedures

Southern Nuclear Operating Company Standard Emergency Plan, Ver. 2.0
Standard Emergency Plan Annex for Vogtle Electric Generating Plant Units 1 and 2, Ver. 2.0
NMP-EP-300-GL01, Emergency Preparedness Advisory Committee, Ver. 3.0
NMP-EP-300, SNC Emergency Preparedness Conduct of Operations, Ver. 25.0
NMP-EP-303, Drill and Exercise Standards, Ver. 18.0
NMP-EP-303-F05, Drill and Exercise Objectives, Ver. 3.0

Records and Data

NL-17-0519, SNC Vogtle Electric Generating Plant, U1 Amendment to Renewed Facility
Operating License, Amendment No. 184, dated 3/14/17
NRC Graded Exercise May 11, 2016 Scenario Abstract
FEMA Final After Action Report, Vogtle Electric Generating Plant, Radiological Emergency
Preparedness Exercise, Exercise date: November 15, 2016
Southern Company Emergency Preparedness Drill Report – May 11, 2016, NOEP-246, NRC
Graded Exercise dated June 9, 2016
Southern Company Emergency Preparedness Drill Report – February 22, 2017, NOEP-256,
Facility Activation Drill dated March 8, 2017
NRC Graded Exercise, May 11, 2016 Scenario MSEL Timeline
Facility Activation drill, February 22, 2017, Scenario Abstract
Facility Activation drill, February 22, 2017, Timeline
Eight-year Drill and Exercise Tracking of Exercise Drills
Standard Emergency Plan Annex for Vogtle Electric Generating Plant, Units 1 and 2,
Versions 1 and 2
Standard Emergency Plan Versions 1 and 2
NRC/FEMA Evaluated Exercise Scenario, May 15, 2018
NRC/FEMA Evaluated Exercise, Exercise Objectives, May 15, 2018
NRC/FEMA Evaluated Exercise, In Plant Messages, May 15, 2018
NRC/FEMA Evaluated Exercise, Plant and Play Considerations, May 15, 2018
NRC/FEMA Evaluated Exercise, Scenario Timeline, May 15, 2018
NRC/FEMA Evaluated Exercise, Scope of Play and Participation, May 15, 2018
Midas run for dose assessment for 5/15/18
SNC Dose Assessment data forms, 5/15/18
1 Mile Map with Plume, 5/15/18
1- Plant RP Survey data for 1-AB-C-115 CCP “A”
10 Mile EPZ, NRC Evaluation Exercise, 5/15/18
Meteorological data for NRC Evaluation Exercise, 5/15/18
1-FHB-A-07 & 10 Radiological Data
Radiation Effluent Monitors data for NRC Evaluated Exercise, 5/15/18

Corrective Action Program Documents
CR 10222218, Timely dose projections

60855.1: Operation of an Independent Spent Fuel Storage Installation

Procedures

11882-1, Outside Area Rounds Sheets, Ver. 98.2
93700-C, Used Fuel Loading and Unloading Outage Guidelines, Ver. 9.0
93711-C, HI-STORM System Site Transport, Ver. 11.0
93713-C, MPC Fuel Loading Operations, Ver. 9.1
93714-C, MPC Closure Operations, Ver. 13.1

Miscellaneous Records

TE 998776, VEGP 10 CFR 72.212 Report – Revision for 2018 UFLO 4
RER SNC871334, Vogtle Electric Generation Plant Independent Spent Fuel Storage Installation
10 CFR 72.212 Report
Certificate of Compliance No.1014, Amendment No. 9, Revision No. 1 for the HI-STORM 100
Cask System (TAC No. L24935), March 21, 2016