



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II**

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ATLANTA, GEORGIA 30303-1257

February 9, 2017

William R. Gideon
Site Vice President
Brunswick Steam Electric Plant
8470 River Rd. SE (M/C BNP001)
Southport, NC 28461

**SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT – NRC INTEGRATED INSPECTION
REPORT NOS.: 05000325/2016004 AND 05000324/2016004**

Dear Mr. Gideon:

On December 31, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick Steam Electric Plant Units 1 and 2 facilities. On February 6, 2017, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented one finding of very low safety significance in this report. This finding involved a violation of NRC requirements; and this violation was determined to be Severity Level IV under the traditional enforcement process. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy. Additionally, inspectors documented a licensee-identified violation which was determined to be Severity Level IV in this report. The NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or the significance of the violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, and the NRC Resident Inspector at the Brunswick Steam Electric Plant.

W. Gideon

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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/

Steven D. Rose, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Docket Nos.: 50-325, 50-324
License Nos.: DPR-71, DPR-62

Enclosure:
IR 05000325, 324/2016004
w/Attachment: Supplementary Information

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W. Gideon

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W. Gideon

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Letter to William R. Gideon from Steven D. Rose dated February 9, 2017

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT – NRC INTEGRATED INSPECTION
REPORT NUMBERS: 05000325/2016004 AND 05000324/2016004

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-325, 50-324

License Nos.: DPR-71, DPR-62

Report No.: 05000325/2016004, 05000324/2016004

Licensee: Duke Energy Progress, Inc.

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: Southport, NC

Dates: October 1, 2016 through December 31, 2016

Inspectors: M. Catts, Senior Resident Inspector
M. Schwieg, Resident Inspector
P. Capehart, Senior Operations Engineer (Section 1R11)
A. Goldau, Operations Engineer (Section 1R11)
M. Bates, Senior Operations Engineer (Section 1R11)

Approved by: Steven D. Rose, Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

SUMMARY

Integrated Inspection Report, 05000325/2016004, 05000324/2016004; October 1, 2016 through December 31, 2016; Brunswick Steam Electric Plant, Units 1 and 2; Follow-up of Events and Notices of Enforcement Discretion.

The report covered a 3-month period of inspection by resident inspectors and regional inspectors. There was one NRC-identified violation documented in this report. 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.

Cornerstone: Mitigating Systems

SL IV. An NRC-identified severity level (SL) IV NCV of 10 CFR 50.73(a)(2)(i)(B) was identified for the failure of the licensee to provide a written report to the NRC within 60 days of identifying a condition which was prohibited by plant Technical Specifications (TSs). The licensee entered this issue into the corrective action program (CAP) as nuclear condition report (NCR) 2091608.

The inspectors had previously evaluated the underlying technical issue and determined the failure to promptly identify and correct a condition adverse to quality, which resulted in the condition prohibited by Technical Specifications (TS), was a performance deficiency. The issue was documented as a Green NCV, 05000325;324/2016002-01, Failure to Identify Broken Auto Start Control Relay on Emergency Diesel Generator 1. The ROP's significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it was necessary to address this violation which involved a failure to make a required report to the NRC and was considered to impact the regulatory process, using traditional enforcement to adequately deter non-compliance. Using the NRC Enforcement Policy, Section 6.9.d.9, the SL assigned to this violation was SL IV, because the licensee failed to make a report required by 10 CFR 50.73. This violation also meets the criteria for an NCV because it was not repetitive or willful, and was entered into the licensee's CAP. Traditional enforcement violations are not assessed for cross-cutting aspects. (Section 4OA3)

A violation of very low safety significance that was identified by the licensee has been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking number is listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent rated thermal power (RTP). On October 4, 2016, the unit was reduced to 70 percent power due to a condensate transient caused by the 1A condensate pump. The unit was returned to 100 percent RTP on October 4, 2016. On October 8, 2016, the unit was reduced to 52 percent power due to grid instability caused by Hurricane Matthew. The unit was returned to 100 percent RTP on October 12, 2016. On October 13, 2016 the unit was reduced to 70 percent power due to the loss of the Delco East line. The unit was returned to 100 percent RTP on October 14, 2016. On November 18, 2016, the unit was reduced to 60 percent power to perform power suppression testing. The licensee identified a fuel leak and inserted the adjacent control rods to suppress the leak. The unit was returned to 100 percent RTP on November 24, 2016. On December 10, 2016, the unit was reduced to 70 percent power for a control rod sequence exchange. The unit was returned to 100 percent RTP on December 12, 2016. The unit remained at or near 100 percent RTP for the remainder of the inspection period.

Unit 2 began the inspection period at or near 100 percent RTP. On October 8, 2016, the unit was reduced to 52 percent power due to grid instability caused by Hurricane Matthew. The unit was returned to 100 percent RTP on October 12, 2016. On October 28, 2016, the unit was reduced to 75 percent power for a control rod improvement. The unit was returned to 100 percent RTP on October 29, 2016. On November 11, 2016, the unit was reduced to 75 percent power for a control rod improvement. The unit was returned to 100 percent RTP on November 12, 2016. On December 2, 2016, the unit was reduced to 75 percent power for a control rod improvement. The unit was returned to 100 percent RTP on December 3, 2016. On December 17, 2016, the unit was reduced to 70 percent power for valve and reactor feed pump testing. The unit was further reduced to 60 percent power due to the inadvertent 2A reactor feed pump trip during testing. The unit was returned to 100 percent RTP on December 18, 2016. On December 19, 2016, the unit was reduced to 70 percent power for control rod improvements. The unit was returned to 100 percent RTP on December 20, 2016. On December 31, 2016, the unit was reduced to 70 percent power for a control rod improvements.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 2 samples)

a. Inspection Scope

.1 Seasonal Extreme Weather Conditions

The inspectors conducted a detailed review of the station's adverse weather procedures written 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. Documents reviewed are listed in the Attachment. The inspectors evaluated the following risk-significant systems:

- Emergency Diesel Generator (EDG)
- Service water system
- FLEX, supplemental, and security diesel fuel oil

.2 Impending Adverse Weather Conditions

The inspectors reviewed the licensee's preparations to protect risk-significant systems from Hurricane Matthew on October 8, 2016. The inspectors evaluated the licensee's implementation of adverse weather preparation procedures and compensatory measures, including operator staffing, before the onset of and during the adverse weather conditions. The inspectors reviewed the licensee's plans to address the ramifications of potentially lasting effects that may result from Hurricane Matthew. The inspectors verified that operator actions specified in the licensee's adverse weather procedure maintain readiness of essential systems. The inspectors verified that required surveillances were current, or were scheduled and completed, if practical, before the onset of anticipated adverse weather conditions. The inspectors also verified that the licensee implemented periodic equipment walkdowns or other measures to ensure that the condition of plant equipment met operability requirements. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04 – 3 samples)

a. Inspection Scope

Partial Walkdown

The inspectors verified that critical portions of the selected systems were correctly aligned by performing partial walkdowns. The inspectors selected systems for assessment because they were a redundant or backup system or train, were important for mitigating risk for the current plant conditions, had been recently realigned, or were a single-train system. The inspectors determined the correct system lineup by reviewing plant procedures and drawings. The inspectors observed whether there was indication of degradation, and if so, verified degradation was being appropriately managed in accordance with an aging management program, if applicable, and it had been entered into the licensee's corrective action program at the appropriate threshold. Documents reviewed are listed in the Attachment.

The inspectors selected the following systems or trains to inspect:

- Unit 1, nuclear service water (NSW) system, October 12, 2016
- Unit 1, EDG 2 alignment with EDG 1 unavailable, October 24, 2016
- Unit 1, high pressure coolant injection (HPCI), November 18, 2016

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05Q – 5 samples)a. Inspection ScopeQuarterly Inspection

The inspectors evaluated the adequacy of selected fire plans by comparing the fire plans to the defined hazards and defense-in-depth features specified in the fire protection program. In evaluating the fire plans, the inspectors assessed the following items:

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

The inspectors toured the following fire areas to assess material condition and operational status of fire protection equipment. Documents reviewed are listed in the Attachment.

- 0PFP-DGFST, Diesel Generator and Fuel Oil Storage Tank
- 1PFP-RB1-1g N/S, Unit 1, Reactor Building North/South, 20 foot elevation
- 1PFP-DG-6,7,8,9, E5-E8 Switchgear Rooms, 23 foot elevation
- 1PFP-DG-2-5, EDGs 1-4 Cells, 23 foot elevation
- 0PFP-MBPA, Independent Spent Fuel Storage Installation Building

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)a. Inspection ScopeInternal Flooding

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

properly addressing issues using the CAP. Documents reviewed are listed in the Attachment.

- EDG Building

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance (71111.11 – 2Q, 1A &1B samples)

a. Inspection Scope

.1 Resident Inspector Quarterly Review of Licensed Operator Regualification

On October 12, 2016, the inspectors observed an evaluated simulator scenario administered to an operating crew as part of the annual requalification operating test required by 10 CFR 55.59, "Requalification." The scenario consisted of the loss of a conventional service water (CSW) pump, a loss of offsite power, and a loss of coolant accident.

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

Documents reviewed are listed in the Attachment.

.2 Resident Inspector Quarterly Review of Licensed Operator Performance in the Actual Plant/Main Control Room

The inspectors observed licensed operator performance in the main control room during a rise in the Unit 2 drywell pressure, Hurricane Matthew, the Unit 1 loss of the Delco East line, and the Unit 2 reactor feedwater pump recirculation valve failing open.

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

Documents reviewed are listed in the Attachment.

.3 Licensed Operator Regualification

The inspectors reviewed the facility operating history and associated documents in preparation for this inspection. During the week of October 17 – 20, 2016, the inspectors reviewed documentation, interviewed licensee personnel, and observed the administration of operating tests associated with the licensee's operator regualification program. Each of the activities performed by the inspectors was done to assess the effectiveness of the facility licensee in implementing regualification requirements identified in 10 CFR Part 55, "Operators' Licenses." The evaluations were also performed to determine if the licensee effectively implemented operator regualification guidelines established in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," and Inspection Procedure 71111.11, "Licensed Operator Regualification Program." The inspectors also evaluated the licensee's simulation facility for adequacy of its use in operator licensing examinations using ANSI/ANS-3.5-2009, "American National Standard for Nuclear Power Plant Simulators for use in Operator Training and Examination." The inspectors observed two full crews during the performance of the operating tests. Documentation reviewed included written examinations, Job Performance Measures (JPMs), simulator scenarios, licensee procedures, on-shift records, simulator modification request records, simulator performance test records, operator feedback records, licensed operator qualification records, remediation plans, watchstanding records, and medical records. The records were inspected using the criteria listed in Inspection Procedure 71111.11. Documents reviewed are listed in the Attachment.

.4 Annual Review of Licensee Regualification Examination Results

On October 20, 2016, the licensee completed the annual regualification operating examinations required to be administered to all licensed operators in accordance with Title 10 of the Code of Federal Regulations 55.59(a)(2), "Regualification Requirements," of the NRC's "Operator's Licenses." The inspectors performed an in-office review of the overall pass/fail results of the individual operating examinations and the crew simulator operating examinations in accordance with Inspection Procedure (IP) 71111.11, "Licensed Operator Regualification Program." These results were compared to the thresholds established in Section 3.02, "Regualification Examination Results," of IP 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 4 samples)

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. In addition, the inspectors performed a review of quality control to ensure the

licensee was in compliance with their Quality Assurance Program requirements. Documents reviewed are listed in the Attachment.

- Unit 1, main steam isolation valve 1-B21-F022A failed to actuate the reactor protection system logic, NCR 2080465
- Unit 2, Reactor Building explosion bolts missing during inspection, NCR 2073738
- Unit 2, HPCI auxiliary oil pump motor overload alarm relay failure, Work Order (WO) 13413628 [Quality Control]
- Licensee's 10 CFR 50.65(a)(3) Periodic Evaluation, Self-Assessment 756236

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13 – 4 samples)

a. Inspection Scope

The inspectors reviewed the 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. Documents reviewed are listed in the Attachment.

- Units 1 and 2, elevated risk condition due to Hurricane Matthew on October 6-8, 2016
- Unit 1, elevated risk condition due to downpower to 70 percent power due to the loss of the Delco East line on October 13, 2016
- Units 1 and 2, elevated risk condition due to EDG 1 maintenance outage on October 24, 2016
- Unit 1, elevated risk condition due to the downpower to 60 percent power to identify and suppress a fuel leak on November 18, 2016

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15 –3 samples)

a. Inspection Scope

Operability and Functionality Review

The inspectors selected the 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 TS 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 TS 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. Documents reviewed are listed in the Attachment.

- U1, low pressure coolant injection outboard injection valve F017A, gear box emitted smoke while testing closed, September 9, 2016
- Unit 2, EDG 3 governor oil accumulation, November 2, 2016
- Unit 1, reactor core isolation cooling (RCIC) pump seal purge piping leak, November 5, 2016

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19 – 6 samples)

a. Inspection Scope

The inspectors either observed post-maintenance testing or reviewed the test results for the 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.

- Unit 2, WO 20073286, replace EDG 4 dummy fuse, October 19, 2016
- Unit 1, WO 12222579, EDG 1 starting air planned maintenance, October 27, 2016
- Unit 2, WO 20040298, E3 relay planned maintenance, November 16, 2016
- Unit 1, WO 20012242, 1A standby liquid control system breaker planned maintenance, November 30, 2016
- Unit 2, WO 20103155, 2C CSW ground relay test, November 30, 2016
- Unit 1, WO 20055376, 1A NSW pump strainer planned maintenance, December 12, 2016

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. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22 – 3 samples)

a. Inspection Scope

The inspectors reviewed the surveillance tests listed below and either observed the test or reviewed test results to verify testing activities adequately demonstrated that the affected structures, systems, and components remained capable of performing the intended safety functions (under conditions as close as practical to design bases conditions or as required by TSs) and maintained their operational readiness.

The inspectors evaluated the test activities to assess for preconditioning of equipment, procedure adherence, and equipment alignment following completion of the surveillance. Additionally, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with surveillance testing. Documents reviewed are listed in the Attachment.

Routine Surveillance Tests

- OPT-12.2D, Unit 2, EDG 4 Monthly Load Test, October 18, 2016
- 1MST-PCIS24R, Unit 1, Primary Containment Isolation System High Condenser Pressure Instrument Channel Calibration, October 19, 2016

In-Service Tests (IST)

- OPT-08.1.4B, Unit 1 Residual Heat Removal Service Water System Operability Test, November 3, 2016

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (71151 – 4 samples)

a. Inspection Scope

The inspectors reviewed a sample of the performance indicator (PI) data, submitted by the licensee, for the Unit 1 and Unit 2 PIs listed below. The inspectors reviewed plant records compiled between October 1, 2015 and September 30, 2016 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. Documents reviewed are listed in the Attachment.

Cornerstone: Mitigating Systems

- Unit 1, mitigating system performance index (MSPI) HPCI
- Unit 1, MSPI RCIC
- Unit 2, MSPI HPCI
- Unit 2, MSPI RCIC

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 1 sample)

.1 Routine Review

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

.2 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 safety related equipment failures and issues, but also considered the results of inspector daily NCR screenings, licensee trending efforts, and licensee human performance results. The review nominally considered the 6-month period of July 1, 2016 through December 31, 2016, 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 are listed in the Attachment.

b. Findings and Observations

No findings were identified.

The inspectors evaluated a sample of NCRs generated over the course of the past two quarters by the engineering and operations department. The inspectors determined that, in most cases, the issues were appropriately evaluated by licensee staff for

potential trends and resolved within the scope of the CAP. The inspectors also reviewed NCRs over the past two years associated with the failure or degradation of safety-related equipment and equipment important to safety. The inspectors identified a trend in inadequate procedures. Of the 37 equipment issues reviewed, 13 of the issues were related to inadequate procedures.

The inspectors considered that, while not a violation of regulatory requirements, this was an opportunity to identify an adverse trend by the licensee. The licensee entered this trend into the CAP as NCR 2089442.

4OA3 Follow-up of Events (71153 – 1 sample)

a. Inspection Scope

On February 7, 2016, an electrical fault occurred on a 4 kV bus which initiated an auto start of all four EDGs. EDG 1 exhibited excessive kW swings. The swings were attributed to a broken auto start control relay (ASCR) which caused the EDG to swap between governor droop and isochronous modes. The licensee entered the issue into the CAP as NCRs 2007720, 2030568, and 2000871. The inspectors reviewed the cause evaluation. Documents reviewed are listed in the Attachment.

b. Findings

Failure to Submit a Licensee Event Report for a Condition Prohibited by Technical Specification

Introduction. An NRC-identified SL IV NCV of 10 CFR 50.73(a)(2)(i)(B) was identified for the failure of the licensee to provide a written report to the NRC within 60 days of identifying a condition which was prohibited by plant TSs. The licensee entered this issue into the corrective action program (CAP) as nuclear condition report (NCR) 2091608.

Description. On February 7, 2016, an electrical fault occurred on a 4 kV bus which initiated an auto start of all four EDGs. During a walkdown, the inspectors identified excessive kW swings on EDG 1. The licensee issued NCR 2000871, and concluded the EDG was operable and the condition was not unexpected. On March 5, 2016, a broken auto start control relay (ASCR) was discovered during the modifications of EDG 1. The licensee issued NCR 2007720; which concluded the relay broke during the current maintenance window. The inspectors determined the licensee did not evaluate the cause or past operability. The NCR was closed to WO 12222576, which replaced the ASCR.

During an engineering review in May 2016, the licensee determined the broken ASCR was the cause of the kW swings due to oscillating between governor droop and isochronous modes. The inspectors determined the licensee failed to recognize the EDG 1 had an increasing trend in load and frequency swings when EDG 1 load was increased. The kW swings were significant enough to provide reasonable doubt that EDG1 would achieve the maximum load required by T.S. 3.8.1.11 (3850 kW). Additionally, the frequency swings could be outside the T.S. 3.8.1.7 and T.S. 3.8.1.14 limits (steady state frequency required to be greater than or equal to 58.8 Hz and less than or equal to 61.2 Hz) under fully loaded conditions. Therefore, EDG 1 was

considered to be inoperable from February 7, 2016 until March 5, 2016 which was greater than the T.S 3.8.1.11 allowed operating time AOT of 14 days. On August 1, 2016, the inspectors performed the quarterly exit with licensee management dispositioning that EDG 1 was inoperable when the kW swings occurred. The inspectors documented this conclusion in NRC Integrated Inspection Report 05000325;324/2016002, as an NRC-identified Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, for the failure to promptly identify and correct a condition adverse to quality for EDG 1.

Analysis. The inspectors had previously evaluated the underlying technical issue and determined the failure to promptly identify and correct a condition adverse to quality, which resulted in the condition prohibited by TS, was a performance deficiency. The issue was documented as a Green NCV, 05000325;324/2016002-01, Failure to Identify Broken Auto Start Control Relay on Emergency Diesel Generator 1. The ROP's significance determination process does not specifically consider the regulatory process impact in its assessment of licensee performance. Therefore, it was necessary to address this violation which involved a failure to make a required report to the NRC and was considered to impact the regulatory process, using traditional enforcement to adequately deter non-compliance. Using the NRC Enforcement Policy, Section 6.9.d.9, the SL assigned to this violation was SL IV, because the licensee failed to make a report required by 10 CFR 50.73. This violation also meets the criteria for an NCV because it was not repetitive or willful, and was entered into the licensee's CAP as NCR 2091608. Traditional enforcement violations are not assessed for cross-cutting aspects.

Enforcement. 10 CFR 50.73(a)(2)(i)(B) states in part that the holder of an operating license shall submit an LER within 60 days of discovery of the event, which includes any operation or condition which was prohibited by TSs. Contrary to the above, the licensee failed to submit a report within 60 days of August 1, 2016, after the EDG 1 was dispositioned to be inoperable and could not reasonably achieve its safety function. The licensee entered this issue into the CAP as NCR 2091608. Because this violation was of very low safety significance, was not repetitive or willful and it was entered into the licensee's CAP, this violation is being treated as a SL IV NCV, consistent with the NRC Enforcement Policy and is designated as: SL IV NCV 05000325;324/2016004-01; Failure to Submit a Licensee Event Report for a Condition Prohibited by Technical Specification.

4OA6 Meetings, Including Exit

On February 6, 2017, the resident inspectors presented the inspection results to Mr. Gideon and other members of the licensee's staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

4OA7 Licensee Identified Violations

The following violation was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as a SL IV NCV.

10 CFR 55.33(e), states in part, "To maintain an active status, a license holder shall actively perform the functions of an operator or senior operator on a minimum of seven 8-hour or five 12-hour shifts per calendar quarter. (f) If paragraph (e) is not met, before resumption of function...an authorized representative of the facility licensee shall

certify...(2) That the licensee has completed a minimum of 40 hours of shift function under the direction of an operator or senior operator as appropriate and that the position to which the individual will be assigned. The 40 hours must have included a complete tour of the plant and all required shift turnover procedures.”

0 OI-01-01.05, License Activation and Maintenance, is a licensee written procedure to ensure 10 CFR 55.53(f) requirements are satisfied. Section 5.3.2(d) states, “An inactive licensee must stand a minimum of four 12 hour shifts under the direction of an active license holder and in the position to which the individual will be assigned. The time on shift must have included a complete tour of the plant and all required shift turnover procedures under the direction of a Shift Manager or Control Room Supervisor with an active license.”

Contrary to the above, on October 16, 2016, the licensee identified that they failed to properly reactivate a licensed senior reactor operator (SRO) on June 10, 2016 and subsequently allowed the operator to stand watch in active licensed positions for a four month period. Because this issue had no adverse impacts to nuclear safety, no incidents or incorrect assessments made during this time frame by the individual in question, and the event has been entered into the licensee’s CAP as NCR 2070317, this violation is being treated as a SL IV NCV, consistent with the NRC Enforcement Policy.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

| | |
|--------------|--|
| W. Gideon | Vice President |
| K. Moser | Plant Manager |
| K. Allen | Director, Design Engineering |
| B. Bagwell | Environmental & Chemistry |
| A. Baker | Supervisor, Environmental & Chemistry |
| J. Berry | Supervisor, LOCT Training |
| A. Brittain | Director, Nuclear Plant Security |
| P. Brown | Manager, Nuclear Performance Improvement |
| J. Bryant | Regulatory Affairs |
| R. Carpenter | Radiation Monitor Engineer |
| C. Dunsmore | Manager, Nuclear Outage |
| J. Ferguson | Manager, Nuclear Oversight |
| L. Grzeck | Manager, Nuclear Regulatory Affairs |
| J. Hicks | Manager, Nuclear Training |
| B. Houston | Manager, Nuclear Maintenance |
| F. Jefferson | Director, Nuclear Engineering, Mechanical Systems |
| J. Johnson | Manager, Nuclear Chemistry |
| K. Krueger | Manager, Nuclear Operations |
| J. McAdoo | Manager, Nuclear Rad Protection |
| M. McPherson | Operator Requal |
| J. Nolin | General Manager, Nuclear Engineering |
| W. Orlando | Superintendent, E/I&C |
| A. Padleckas | Assistant Ops Manager, Training |
| D. Petrusic | Superintendent, Environmental & Chemistry |
| J. Pierce | Manager, Nuclear Work Management |
| A. Pope | Director, Nuclear Organizational Effectiveness |
| E. Rau | Operations Training |
| M. Regan | Project Manager, Major Projects |
| L. Rohrbaugh | Operator Training |
| M. Smiley | Manager, Nuclear Ops Training |
| L. Spencer | Operator Training |
| R. Wiemann | Director, Nuclear Engineering, BNP Plant Engineering |
| E. Williams | Operations Manager |

State of North Carolina

| | |
|--------|---|
| P. Cox | Department of Health and Human Services |
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NRC Personnel

| | |
|---------|----------------------------------|
| S. Rose | Chief, Reactor Projects Branch 4 |
|---------|----------------------------------|

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

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| 05000325;324/2016004-01 | NCV | Failure to Submit a Licensee Event Report for a Condition Prohibited by Technical Specification (Section 4OA3) |
|-------------------------|-----|--|

LIST OF DOCUMENTS REVIEWED

Common Documents Reviewed

Updated Final Safety Analysis Report
Individual Plant Examination
Individual Plant Examination of External Events
Technical Specifications and Bases
Technical Requirements Manual
Control Room Narrative Logs
Plan of the Day

Section 1R01: Adverse Weather Protection

Procedures

AD-EG-ALL-1523, Temporary Ignition Source Control, Rev. 0
OOI-01.03, Non-Routine Activities, Rev. 65
OAP-062, Seasonal Preparations, Rev. 5
OPM-HT001, Preventative Maintenance on Plant Freeze Protection and Heat Tracing System, Rev. 18
OAO-13.0, Operation During Hurricane, Flood Conditions, Tornado, or Earthquake, Rev. 64
OAO-22.0, Grid Instability, Rev. 27
OAI-68, Brunswick Nuclear Plant Response to Severe Weather Warnings, Rev. 50
OAO-36.1, Loss of Any 4160V Buses or 480V E-Buses, Rev. 69
OPEP-02.6, Severe Weather, Rev. 19
OPEP-02.6.26, Activation and Operation of the Technical Support Center (TSC), Rev. 37
OPEP-02.6.27, Activation and Operation of the Emergency Operations Facility (EOF), Rev. 39
OPEP-02.6.30, Alternate Emergency Facility Operation, Rev. 009
OPLP-37, Equipment Important to Emergency Preparedness and Emergency Response Organization Response, Rev. 008
AD-WC-ALL-0230, Seasonal Readiness, Rev. 0

Condition Reports

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|---------|--------|---------|---------|--------|---------|
| 2071668 | 725313 | 1991064 | 1959947 | 735445 | 2071473 |
| 2071453 | | | | | |

Add hurricane CRs

Work Orders

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| 20050551 | 20050552 | 20030575 |
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Miscellaneous

Drawing LL-09049, Freeze Protection Schedule, Sht. 1, Rev. 6

Section 1R04: Equipment Alignment

Procedures

OOP-39, Diesel Generator Operating Procedure, Rev. 175
IOP-43, Service Water Operating Procedure, Rev. 125
IOP-19, High Pressure Coolant Injection System Operating Procedure, Rev. 96

Condition Reports

2069643

Drawings

D-02265, Units 1 Starting Air for EDGs Sht 1B, Rev. 25
 D-02270, Units 1 EDG Lube Oil Piping Diagram Sht 1B, Rev. 22
 D-02523, Unit 2 High Pressure Coolant Injection System P&ID, Rev. 59

Miscellaneous

SD-39, Emergency Diesel Generator, Rev. 20
 SD-19, HPCI system, Rev. 24
 BN-19.0.1, High Pressure Coolant Injection (HPCI) System, Rev. 04

Section 1R05: Fire ProtectionProcedures

0PFP-PBAA, Power Block Auxiliary Areas Pre-Fire Plans, Rev. 30
 0PFP-DG, Diesel Generator Building, Rev. 15
 0PFP-MBPA, Miscellaneous Buildings Pre-Fire Plans Protected Area, Rev. 28
 1PFP-RB, Reactor Building Pre-Fire Plans, Rev. 18

Section 1R06: Internal FloodingProcedures

0AI-68, Brunswick Nuclear Plant Response to Severe Weather Warnings, Rev. 50
 AD-EG-BNP-1214, Condition Monitoring of Structures, Rev. 0

Condition Reports

555550 2087612

Drawings

F-03518, Diesel Generator Building Plan – Cable Trey, Bus Duct & Conduit Elevation 23'-0" South, Rev. E
 F-03519, Diesel Generator Building Plan – Cable Trey, Bus Duct & Conduit Elevation 23'-0" North, Rev. E

Miscellaneous

DBD-144, External and Internal Flooding Topical Design Basis Document, Rev. 0

Section 1R11: Licensed Operator RequalificationProcedures

0AOP-13.0, Operation During Hurricane, Flood Conditions, Tornado, or Earthquake, Rev. 64
 0AOP-14.0, Abnormal Primary Containment Conditions, Rev. 30
 0AOP-19, Conventional Service Water Failure, Rev. 26
 0AOP-22.0, Grid Instability, Rev. 27
 0AOP-23.0, Condensate/Feedwater System Failure, Rev. 43
 0AOP-36.1, Loss of Any 4160V Buses or 480V E-Buses, Rev. 69
 0OI-01.05, License Activation and Maintenance, Rev. 26
 SI-216.1, Regulatory Testing, Rev. 21
 AD-TQ-ALL-0425, Simulator Scenario Based Testing, Rev. 1
 TAP-412, Simulator Operation and Maintenance, Rev. 7
 TAP-412, LOCT Administrative Procedure, Rev. 15

Simulator Steady State Tests

STP-SS-002, 50% Power Steady State Comparison, Rev. 12

STP-SS-003, 75% Power Steady State Comparison, Rev 12

STP-SS-004, 100% Power Steady State Comparison, Rev 13

Simulator Normal Evolution Tests

STP-RT-001, Simulator Real Time Test, Rev. 10

STP-OL-001, Simulator Operating Limits Test, Rev. 9

Simulator Transient Tests

STP-TN-001, Manual Scram, Rev 3

STP-TN-002, Simultaneous Trip All Feedwater Pumps, Rev. 3

STP-TN-003, Simultaneous Closure of All MSIV's, Rev. 3

STP-TN-004, Simultaneous Trip of Both Recirculation Pumps, Rev. 4

STP-TN-005, Single Recirculation Pump Trip, Rev. 5

STP-TN-006, Turbine Trip (Does Not Result In An Immediate Rx Scram), Rev. 4

STP-TN-007, Maximum Rate Power Ramp Recirc Flow Controller In Manual, Rev. 5

STP-TN-008, Design Basis LOCA In Conjunction With A Loss Of Off Site Power, Rev. 6

STP-TN-009, Maximum Size Unisolable Main Steam Line Rupture, Rev. 5

STP-TN-010, MSIV Closure With One Stuck Open Safety/Relief Valve & High Press
ECCS, inhibited, Rev. 4

STP-TN-011, Inadvertent HPCI Initiation, Rev. 5

Simulator Scenario Based Tests

Scenario Based Testing (SBT) for Simulator Scenario LORX-141

Scenario Based Testing (SBT) for Simulator Scenario LORX-143

Scenario Packages

LORX-145, SRV "J" Fail Open/Loss of Control Power, 2A RFP trip, 4160 VAC Bus 2B Trip,
Electrical ATWS, HPCI Steam Tunnel leak/SDV Rupture, Rev. 1

LORX-147, NSW Pump Trip with Failure of Standby Pump to Auto Start, Intake Structure
Blockage, Loss of Main Condenser Vacuum, 5 Control Rods Fail to Insert, Medium Break
LOCA, ED, Rev. 3

LORX-148, 2A CSW PUMP Trip (TS/AOP), SAT Failure (AOP), DG 3 & DG 4 Auto Start Failure,
HPCI Aux Oil Pump Fails, Small Steam Leak/Loss of DW Cooling, Large Break LOCA/ECCS
Logic Failures, Rev. 3

LORX-150, Jet Pump Failure, Rod Drift, RWCU Steam Line Rupture In The Reactor Building,
Electrical ATWS, Two Areas Above Maximum Safe Operating Temperature requiring
Emergency Depressurization, Rev. 1

JPM Packages

LOT-SIM-JP-26.0-01, Main Turbine Shutdown with Emergency Isolation of PCB (AP), Rev. 1

LOT-SIM-JP-025-A01, Emergency Equalization around MSIV's, Rev. 6

LOT-SIM-JP-010-A02, Vent the Drywell per OP-10 w/ Stack Rad Monitor Increase >50%,
Rev. 8

LOT-SIM-JP-032-10, Resetting CO-FIC-49, SJAЕ Cond Recirc FCV, Rev. 1

AOT-OJT-JP-302-E03, Secure the Condensate System IAW 0AOP-32.0 - Pumps Fail To Trip,
Rev. 5

AOT-OJT-JP-052-01, Stack Radiation Monitor UPS Power Supply Transfer, Rev. 5

AOT-OJT-JP-303-14, Energizing E7 from E8 Cross-Tie with Breaker Failure, Rev. 2

LOT-OJT-JP-302-E02, Start RCIC from the Remote Shutdown Panel, Rev. 2

LOT-ADM-JP-300-B02, Evaluate Unit 1 Reactor Water Level Instruments Using Caution 1, Rev. 2
 SOT-ADM-301-A20, Determine Protective Action Recommendations (PARs), Rev. 1
 LOT-ADM-JP-300-B00, Determine Primary Containment Water Level and Evaluate PCPL-A, Rev. 2
 SOT-ADM-JP-301-A01, Perform Rapid Dose Assessment per AD-EP-ALL-0202, Rev. 4

Miscellaneous records

Focused self-assessment for 711111.11 conducted 5/16 to 5/20/16
 License Reactivation Packages (9)
 Watch standing / License maintenance records (69)
 Medical Files (15)
 Written Examinations:
 LOCT 15-05 Biennial Exam Reactor Operator
 LOCT 15-05 Biennial Exam Senior Reactor Operator

Section 1R12: Maintenance Effectiveness

Procedures

AD-EG-ALL-1210, Maintenance Rule Program, Rev. 0

Condition Reports

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|---------|--------|--------|--------|---------|---------|
| 759929 | 759923 | 738146 | 592712 | 2080465 | 2073738 |
| 2043067 | | | | | |

Work Orders

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|----------|----------|----------|
| 13413628 | 20052931 | 13413628 |
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Miscellaneous

Maintenance Rule Scoping Document, 1005 U1 Input to Reactor Protection System, High Pressure Coolant Injection / Reactor Core Isolation Cooling and Primary Containment Isolation
 Licensee's 10 CFR 50.65(a)(3) Periodic Evaluation, Self-Assessment 756236

Section 1R13: Maintenance Risk Assessment and Emergent Work Control

Procedures

BNP-PSA-041, BNP On-Line Equipment Out of Service Probabilistic Safety Assessment Model, Rev. 017
 AD-WC-ALL-0250, Work Implementation and Completion, Rev. 02
 AD-WC-ALL-0410, Work Activity Integrated Risk Management, Rev. 02
 AD-WC-ALL-0200, Online Work Management, Rev. 06
 AD-OP-ALL-0201, Protected Equipment, Rev. 02
 AD-WC-ALL-0430, Outage Risk Review, Rev. 02
 0AP-025, BNP Integrated Scheduling, Rev. 55
 0AOP-13.0, Operations During Hurricane, Flood Conditions, Tornado, or Earthquake, Rev. 64

Miscellaneous

EOOS Risk Assessments

Section 1R15: Operability Evaluations

Procedures

AD-OP-ALL-0105, Operability Determinations and Functionality Assessments, Rev. 03

Condition Reports

| | | | | |
|---------|--------|---------|---------|---------|
| 2076088 | 738314 | 2060354 | 2060494 | 2060355 |
|---------|--------|---------|---------|---------|

Work Orders

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| 13499877 | 20044810 |
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Section 1R19: Post Maintenance TestingProcedures

OPT-06.1, Standby Liquid Control System Operability Test, Rev. 85
 2MST-DG22R, DG-4 Trip Bypass Logic Test, Rev. 24
 OPT-12.3.2A, No. 1 Diesel Generator Starting Air Valve Operability Test, Rev. 19
 2OP-43, Service Water System Operability Test, Rev. 163
 2MST-DG23AR, DG Undervoltage Relay 27/59E Emergency Bus E3 Channel Cal, Rev. 2

Condition Reports

| | |
|---------|---------|
| 1961495 | 2085352 |
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Work Orders

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|----------|----------|----------|----------|----------|----------|
| 20073286 | 12222579 | 20012242 | 20103155 | 20040298 | 20055376 |
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Section 1R22: Surveillance TestingProcedures

OPT-12.2D, No.4 Diesel Generator Monthly Load Test, Rev. 114
 OPT-08.1.4b, RHR Service Water System Operability Test - Loop B, Rev. 74
 1MST-PCIS24R, Unit 1, Primary Containment Isolation System High Condenser Pressure Instrument Channel Calibration, Rev. 13

Section 4OA1: Performance IndicatorsProcedures

AD-LS-ALL-0004. Performance Indicators and Monthly Operating Report, Rev. 01

MiscellaneousOperator Logs

NEI 99-02, Regulatory Assessment Performance Indicator Guideline, Rev. 7
 Brunswick Unit 1 PI Summary, October 2015 – September 2016
 Brunswick Unit 2 PI Summary, October 2015 – September 2016
 Monthly PI Reports, October 2015 – September 2016
 System Health Reports, October 2015 – September 2016
 Licensee Event Reports, October 2015 – September 2016

Section 4OA2: Identification and Resolution of ProblemsProcedures

AD-PI-ALL-0100, Corrective Action Program, Rev. 7
 AD-PI-ALL-0101, Root Cause Evaluation, Rev. 3
 AD-PI-ALL-0102, Apparent Cause Evaluation, Rev. 3
 AD-PI-ALL-0103, Quick Cause Evaluation, Rev. 3
 AD-PI-ALL-0400, Operating Experience Program, Rev. 2

Condition Reports

| | | | | |
|---------|---------|---------|---------|---------|
| 2069642 | 2069643 | 2069422 | 2075154 | 2075598 |
| 2085352 | 2085129 | 2083615 | | |

Section 4OA3: Follow-up of EventsProcedures

0OI-01.07, Notifications, Rev. 38

Condition Reports

2000871 2007720 2030568

Section 4OA7: Licensee Identified ViolationsMiscellaneous records

License Reactivation Packages (9)

Watch standing / License maintenance records (69)