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

January 30, 2015

Mr. William R. Gideon
Vice President
Duke Energy Progress, Inc.
Brunswick Steam Electric Plant
P.O. Box 10429
Southport, NC 28461

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION REPORT NOS. 05000325/2014005 AND 05000324/2014005

Dear Mr. Gideon:

On December 31, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick Unit 1 and 2 facilities. The enclosed integrated inspection report documents the inspection findings, which were discussed on January 20, 2015, with you and other members of your staff.

One NRC-identified finding and one self-revealing finding of very low safety significance (Green) were identified during this inspection. These findings were determined to involve a violation of NRC requirements. The NRC is treating these findings as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

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

If you disagree with the cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at the Brunswick Steam Electric Plant.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390, “Public Inspections, Exemptions, Requests for Withholding,” of the NRC's Rules of Practice, a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

George T. Hopper, Chief
Reactor Projects Branch 4
Division of Reactor Projects

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

Enclosure: Inspection Report 05000325, 324/2014005
w/Attachment: Supplemental Information

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Letter to William R. Gideon from George Hopper dated January 30, 2015.

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION REPORT NUMBERS: 05000325/2014005 AND 05000324/2014005

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REGION II

Docket Nos.:	50-325, 50-324
License Nos.:	DPR-71, DPR-62
Report No.:	05000325/2014005, 05000324/2014005
Licensee:	Duke Energy Progress, Inc.
Facility:	Brunswick Steam Electric Plant, Units 1 & 2
Location:	Southport, North Carolina
Dates:	October 1, 2014 through December 31, 2014
Inspectors:	A. Scarbeary, Senior Resident Inspector (Acting) M. Catts, Senior Resident Inspector M. Schwieg, Resident Inspector G. Kolcum, Senior Resident Inspector, North Anna (Section 4OA2) M. Bates, Senior Operations Engineer, RII (Section 1R11)
Approved by:	George T. Hopper, Chief Reactor Projects Branch 4 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000325, 324/2014005; October 1, 2014, through December 31, 2014; Duke Energy Progress, Inc., Brunswick Steam Electric Plant, Units 1 and 2, Operability Determinations and Functional Assessments, Surveillance Testing.

This report covers a three-month period of inspection by resident inspectors and announced baseline inspections by regional inspectors. There was one NRC-identified and one self-revealing 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 June 2, 2011. 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 July 9, 2013. The NRC's program for overseeing the safe operations of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5, dated February 2014.

Cornerstone: Mitigating Systems

- Green. The NRC-identified a Green non-cited violation (NCV) of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix B, Criterion III, Design Control, for the failure to ensure adequate tornado missile protection for the emergency diesel generator (EDG) 4-day fuel oil tank ventilation piping. Specifically, it was determined that the ventilation piping could be sheared with a design basis tornado missile at the 4-day fuel oil tank building roof level and water intrusion into the EDG fuel oil system would occur during a design basis rain event that would prevent the diesel from performing its required safety function. The licensee documented this issue in their corrective action program (CAP) and performed corrective actions to install concrete blocks around the piping.

  The inspectors determined that the finding was more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, because it is associated with the Mitigating Systems Cornerstone attributes of Protection Against External Factors and Equipment Performance, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, it was determined that the ventilation piping could be sheared with a design basis tornado missile at the 4-day fuel oil tank building roof level and water intrusion into the EDG fuel oil system would occur during a design basis rain event that would prevent the EDG from performing its required safety function. Using IMC 0609, Appendix A, issued June 19, 2012, "The Significance Determination Process (SDP) for Findings At-Power," the inspectors determined the finding screened to a detailed risk evaluation since the EDG1 fuel oil system was assumed to be completely failed due to a tornado, and it would degrade one or more trains of a system that supports a risk significant system or function. The regional Senior Reactor Analyst performed a detailed risk evaluation by using a qualitative screening analysis to determine the significance of the finding. Tornado initiating event frequency was derived from Nation Weather Service data. Because of the low likelihood of a tornado powerful enough to throw an object of sufficient size to damage the piping, the remote chance the thrown object would strike the vent pipe, and because the remaining EDGs

would not be impacted in the same way by the tornado, the finding was determined to be Green. The inspectors did not identify a cross-cutting aspect associated with this finding because the finding is an old design issue that has been in place since original plant construction. (Section 1R15)

- Green. A Green self-revealing NCV of 10 CFR Part 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, was identified for the failure to conduct the number 3 EDG monthly load test in accordance with the prescribed technical specification surveillance test procedure. Specifically, plant personnel performing the load test on EDG3 manually synched the generator out-of-phase to its corresponding emergency bus, causing equipment damage to the collector ring and brushes and the silicon controlled rectifier (SCR) circuitry. The licensee documented the issue in their CAP, completed a prompt investigation, and performed a root cause evaluation. The EDG was immediately repaired and additional corrective actions include: 1) revise all EDG monthly load test procedures with "cautions" to emphasize the importance of synching the generator properly and performing the steps of the procedure as prescribed; and 2) install synch check relays on all manually paralleled generators.

  The finding was more than minor in accordance with IMC 0612, Appendix B, because it is associated with the Mitigating Systems Cornerstone attribute of Human Performance, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, plant personnel performing the local load test on EDG3 manually synched the generator out-of-phase to its corresponding emergency bus, resulting in extended EDG3 inoperability and equipment damage to the collector ring, brushes, and the SCR circuitry. Utilizing IMC 0609, Appendix A, Exhibit 1, effective July 1, 2012, the finding screened as Green by answering "no" to the question related to an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for >24 hrs. The finding had a cross-cutting aspect in the area of Human Performance related to the aspect of Avoid Complacency, in that individuals failed to recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes, and implement appropriate error reduction tools. In this event, the operators had an inaccurate risk perception that the evolution of increasing load on the EDG was more critical than synching the generator properly. This was emphasized during the pre-job brief and not identified by the supervisory oversight of the evolution. [H.12] (Section 1R22)

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at rated thermal power (RTP). On December 19, 2014, the unit was downpowered to 70 percent for a control rod sequence exchange. The unit was returned to RTP on December 21, 2014 and remained at or near RTP for the remainder of the inspection period.

Unit 2 began the inspection period at RTP. On October 10, 2014, the unit was downpowered to 70 percent for a control rod sequence exchange. The unit was returned to RTP on October 11, 2014. On November 18, 2014, the unit was downpowered to 70 percent for a control rod sequence exchange. The unit was returned to RTP on November 19, 2014. On December 5, 2014, the unit was downpowered to 70 percent for a control rod sequence exchange. The unit was returned to RTP on December 6, 2014, and remained at or near RTP for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01 – 2 samples)

a. Inspection Scope

.1 Seasonal Extreme Weather Conditions

The inspectors conducted a detailed review of the station's seasonal preparation procedures written for winter conditions. 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 seasonal preparation procedures and compensatory measures before the onset of, and during, winter weather conditions. The inspectors walked down the following buildings that are designed to protect risk-significant systems:

- Service Water Building
- Intake Structure and Circulating Water Pump Bay
- EDG Building
- Control Building

Documents reviewed are listed in the attachment.

.2 Impending Adverse Weather Conditions

The inspectors reviewed the licensee's preparations to protect risk-significant systems during a tornado watch on November 17, 2014. The inspectors evaluated the licensee's

implementation of adverse weather preparation procedures and compensatory measures, including operator staffing, before the onset of the adverse weather conditions. The inspectors reviewed the licensee's plans to address the ramifications of potentially lasting effects that may result from a tornado. The inspectors verified that operator actions specified in the licensee's adverse weather procedure maintained 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

a. Inspection Scope

.1 Partial Walkdown (71111.04 – 3 samples)

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. Documents reviewed are listed in the attachment.

The inspectors selected the following three systems or trains to inspect:

- Unit 2 reactor core isolation cooling system (RCIC);
- Unit 1 core spray (CS) south; and
- Unit 1 division I backup nitrogen system.

.2 Complete Walkdown (71111.04 – 1 sample)

The inspectors verified the alignment of the EDG system on October 28-31, 2014. The inspectors selected this system for assessment because it is a risk-significant mitigating system. The inspectors determined the correct system lineup by reviewing plant procedures, drawings, the updated final safety analysis report, and other documents. The inspectors reviewed records related to the system outstanding design issues, maintenance work requests, and deficiencies. The inspectors verified that the selected system was correctly aligned by performing a complete walkdown of accessible components.

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

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05 – 5 samples)

a. Inspection Scope

.1 Quarterly Inspection

The inspectors evaluated the adequacy of selected pre-fire plans and fire protection procedures by comparing the pre-fire plans to the defined hazards and defense-in-depth features specified in the fire protection program. In evaluating the pre-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 CAP

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.

- 2PFP-RB-1c, 2PFP-RB-1d, and 2PFP-RB-2, Unit 2 Reactor Building South and North Residual Heat Removal Room (RHR), High Pressure Coolant Injection (HPCI) Room, -17' Elevation;
- 2PFP-CB-6 and 1PFP-CB-5 , Unit 1 & 2 Control Building Cable Spreading Room, 23' Elevation;
- 2PFP-TB2-04 & 05, 2PFP-TB2-07, 2PFP-TB2-06, 2PFP-TB2-01A & 01B, 2PFP-TB2-01H, and 2PFP-TB2-01C, Unit 2 Turbine Building Reactor Feedwater Pump, Heater Drain Pump, Condensate Booster Pump, Breezeway North & South, Condensate Pump, Mechanical Vacuum Pump Areas, 20' Elevation;
- 2PFP-TB2-01D, 2PFP-TB2-01E, 2PFP-TB2-01F, and 2PFP-TB2-01G, Unit 2 Turbine Building Air Compressor, 2A Air Dryer, 4 kV Switchgear, Hydrogen Seal Oil Areas, 20' Elevation; and
- 0PFP-DG-1, DG Building Basement, 2' Elevation.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06 – 1 sample)

a. Inspection Scope

.1 Internal Flooding

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

- Unit 1 and 2, Turbine Building, 38' and 20' Elevations

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07 – 1 sample)

a. Inspection Scope

Annual Review

The inspectors verified the readiness and availability of the 2A turbine building closed cooling water system heat exchanger (HX) to perform its design function by observing the licensee's HX inspections and reviewing the data from those inspections in response to a leak identified in the channel head area of the HX. The inspectors also verified the licensee appropriately implemented the periodic maintenance method, as well as their implementation of biofouling controls. Additionally, the inspectors verified that the licensee entered any significant issues from the HX inspection into the CAP and that the licensee's corrective actions were appropriate. Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11 – 3 samples)

a. Inspection Scope

.1 Resident Inspector Quarterly Review of Licensed Operator Requalification

The inspectors observed an evaluated simulator scenario, LOT-EOP-016, Reference Leg Plugging, Loss of Level Instrumentation requiring RPV Flooding, administered to an operating crew on November 12, 2014, conducted in accordance with the licensee's accredited requalification training program.

The inspectors assessed the following:

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

Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

.2 Resident Inspector Quarterly Review of Licensed Operator Performance

The inspectors observed licensed operator performance in the main control room during a deep downpower evolution on Unit 1 on December 19, 2014.

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; and
- management and supervision.

Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

.3 Annual Review of Licensee Requalification Examination Results

a. Inspection Scope

On August 29, 2014, the licensee completed the annual requalification operating examinations required to be administered to all licensed operators in accordance with 10 CFR 55.59(a)(2), "Requalification 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 Requalification Program." These results were compared to the thresholds established in Section 3.02, "Requalification Examination Results," of IP 71111.11. Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12 – 2 samples)

a. Inspection Scope

The inspectors assessed the licensee's treatment of the two 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. Documents reviewed are listed in the attachment.

- Unit 1 and Unit 2 HPCI F003, turbine steam supply outboard isolation valve, and F001, steam supply valve, steam leaks
- Unit 1 125/250V DC Switchboard 1B incorrect torque values

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 four maintenance activities listed below to verify that the licensee assessed and managed plant risk as required by 10 CFR 50.65(a)(4) and licensee procedures. The inspectors assessed the adequacy of the licensee's risk assessments and implementation of risk management actions. The inspectors also verified that the licensee was identifying and resolving problems with assessing and managing maintenance-related risk using the CAP. Additionally, for maintenance

resulting from unforeseen situations, the inspectors assessed the effectiveness of the licensee's planning and control of emergent work activities. Documents reviewed are listed in the attachment.

- Unit 1 and Unit 2 elevated risk due to EDG1 unplanned inoperability on October 2, 2014;
- Unit 2 yellow risk condition for RHR system and CS system technical specification surveillance testing on October 8, 2014;
- Unit 1 elevated risk due to EDG1 and 1B conventional service water (CSW) train concurrently scheduled maintenance outages on October 27-28, 2014; and
- Unit 2 elevated risk for new fuel receipt and inspections and Unit 1 emergent work on the 1B-1 Isophase bus cooling fan during the week of December 8-12, 2014.

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors selected the three operability determinations or functionality evaluations listed below for review based on the risk-significance of the associated components and systems. The inspectors reviewed the technical adequacy of the determinations to ensure that technical specification operability was properly justified and the components or systems remained capable of performing their design functions. To verify whether components or systems were operable, the inspectors compared the operability and design criteria in the appropriate sections of the technical specification and updated final safety analysis report to the licensee's evaluations. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. Additionally, the inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with operability evaluations. Documents reviewed are listed in the attachment.

- 2A residual heat removal service water system check valve failure, CR 707742;
- EDG 4-day fuel oil tank ventilation piping not protected against tornado missiles, CR 686589; and
- Unit 1 reactor building ventilation exhaust fans trip, CR 720215.

b. Findings

Introduction. The NRC identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion III, Design Control, for failure to ensure adequate tornado missile protection for the EDG 4-day fuel oil tank ventilation piping.

Description. On May 8, 2014, during a walkdown, the inspectors noted that the EDG 4-day fuel oil tank ventilation piping was not protected from tornado-borne missiles. The inspectors questioned the licensee on the whether this piping needed to be tornado-protected, and if so, could it withstand the design basis tornado and rain event. On August 14, 2014, under WO 13421302, the licensee took corrective actions to place concrete blocks around the ventilation piping. An engineering evaluation was then performed that identified the worst case design basis tornado and rainfall scenario conditions and what effect those would have on EDG operation. It was determined that with the maximum 24-hour rainfall rate and a tornado missile shearing the ventilation piping at the roof level, the worst case scenario was the EDG1 4-day tank filling with water which would be transferred over to the EDG1 saddle tank. The saddle tank would fill to a level high enough to impact EDG operation in less than two hours. Following this evaluation, the licensee completed engineering change (EC) 96860 to install concrete barrier pads around the ventilation piping at the 4-day tank roof level to preclude a tornado missile impact at the most vulnerable part of the piping, and also preclude water accumulation on the roof from entering the EDG 4-day tanks. The inspectors reviewed the engineering evaluation, EC, and interviewed engineering personnel to understand the scenario and the impact to plant operation.

The Brunswick Original Final Safety Analysis Report (Appendix F) and Updated Final Safety Analysis Report (UFSAR), Chapter 3, contain the language of the regulatory requirements for the general design criteria listed in 10 CFR Part 50, Appendix A, and how the licensee complies with those criteria. Criterion 2 for protection against natural phenomena states, in part, that structures, systems, and components (SSCs) important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions. The licensee's statement of compliance states, "SSCs important to safety have been designed with appropriate margin for uncertainties, to permit safe plant operation or shutdown even under conditions of the most severe natural phenomena which have been conservatively postulated to occur at the site." Criterion 4 for missile design bases states, in part, that SSCs important to safety shall be appropriately protected against dynamic effects, including the effects of missiles, which may result from events and conditions outside the nuclear power unit. The licensee's statement of compliance states, "SSCs important to safety have been designed with full consideration of the combined effects of the normal and postulated accident environment, including the effects of pipe whipping or other dynamic effects resulting from the accidents." Section 3.5.1.4 of the UFSAR contains the specific analysis of four potential tornado-borne missiles and the effects on the plant. The impact of one of these missiles, shearing the EDG 4-day fuel oil tank ventilation line, along with water intrusion into the system from the design basis rainfall event, would prevent the EDG (an SSC important to safety) from performing its required safety function of providing a reliable source of AC power to the engineered safety features for safe shutdown of the plant or during design basis accidents.

Analysis. The inspectors determined the failure to ensure adequate tornado missile protection for the EDG 4-day fuel oil tank ventilation piping was a performance deficiency that warranted a significance determination. The inspectors determined that the finding was more than minor in accordance with IMC 0612, "Power Reactor

Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, because it is associated with the Mitigating Systems Cornerstone attributes of Protection Against External Factors and Equipment Performance, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, it was determined that the ventilation piping could be sheared with a design basis tornado missile at the 4-day fuel oil tank building roof level and water intrusion into the EDG fuel oil system would occur during a design basis rain event that would prevent the EDG from performing its required safety function. Using IMC 0609, Appendix A, issued June 19, 2012, The Significance Determination Process (SDP) for Findings At-Power, the inspectors determined the finding screened to a detailed risk evaluation since the EDG1 fuel oil system was assumed to be completely failed due to a tornado, and it would degrade one or more trains of a system that supports a risk significant system or function. The regional Senior Reactor Analyst performed a detailed risk evaluation by using a qualitative screening analysis to determine the significance of the finding. Tornado initiating event frequency was derived from Nation Weather Service data. Because of the low likelihood of a tornado powerful enough to throw an object of sufficient size to damage the piping, the remote chance the thrown object would strike the vent pipe, and because the remaining EDGs would not be impacted in the same way by the tornado, the finding was determined to be Green. The inspectors did not identify a cross-cutting aspect associated with this finding because the finding is an old design issue that has been in place since original plant construction.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," requires, in part, that measures be established to assure that applicable regulatory requirements and the design basis, as defined in Part 50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies, are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, since the initial construction of both units, until August 14, 2014, the licensee failed to translate the appropriate tornado missile protection requirements into the design of the EDG 4-day fuel oil tank ventilation piping. The licensee performed corrective actions to install concrete blocks around the tank ventilation piping. This violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. The violation was entered into the licensee's CAP as CR 686589. (NCV 05000324; 325/2014005-01, Failure to Protect Emergency Diesel Generator 4-Day Fuel Oil Tank Ventilation Piping from Tornado Missiles)

1R18 Plant Modifications (71111.18 – 1 sample)

a. Inspection Scope

The inspectors verified that the plant modification listed below did not affect the safety functions of important safety systems. The inspectors confirmed the modification did not degrade the design bases, licensing bases, and performance capability of risk significant structures, systems and components. The inspectors also verified modification performed during plant configurations involving increased risk did not place the plant in an unsafe condition. Additionally, the inspectors evaluated whether system operability

and availability, configuration control, post-installation test activities, and changes to documents, such as drawings, procedures, and operator training materials, complied with licensee standards and NRC requirements. In addition, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with the modification. Documents reviewed are listed in the attachment.

- Addition of supplemental diesel generator to lengthen the time of the EDG Limiting Condition for Operation (LCO) including mechanical and electrical connections, and acceptance testing (EC 79694).

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors either observed post-maintenance testing (PMT) or reviewed the test results for the six 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.

- Work Order (WO) #13309525, EDG1 Ventilation Damper Temperature Controller, October 2, 2014;
- WO #13450687, EDG1 PMT run after maintenance outage, October 31, 2014;
- WO #13445330, EDG3 Emergency Control Relay (ECR) failure, October 15, 2014;
- WO #13435593, Unit 1 Division II Nitrogen Backup valve failure, September, 13, 2014;
- WO #13442338, 1-SW-1B-CONV-PMP-STR, 1B CSW Pump Strainer: Strainer Through-Wall Leak, October 9, 2014; and
- WO #13437731, 1-SW-1C-CONV-PMP-STR-M, 1C CSW Pump Strainer: Not Working When Expected, September 24, 2014 and WO #13441022, 1-SW-1B-NUC-PMP-STR, 1B Nuclear Service Water Pump Strainer: Perform Internal Inspection of Strainer, October 2, 2014.

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 – 5 samples)

a. Inspection Scope

The inspectors reviewed the surveillance tests listed below and either observed the test or reviewed test results to verify testing adequately demonstrated equipment operability and met technical specification and licensee procedural requirements. 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

- 0PT-12.2C, DG3 Monthly Load Test;
- 2PT-24.1-2, Service Water Pump and Discharge Valve Operability Test;
- 2MST-RPS26R, Reactor Protection System High Drywell Pressure Instrumentation Channel Calibration Test; and
- 0MST-IRM21FR, Intermediate Range Monitor Channel F Calibration/Functional Test.

In-Service Tests

- 0PT-10.1.1, RCIC System Operability Test

b. Findings

Introduction: A Green self-revealing NCV of 10 CFR Part 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, was identified for the failure to conduct the EDG3 monthly load test in accordance with the prescribed technical specification surveillance test procedure. This resulted in EDG3 being manually synched out-of-phase to its corresponding emergency bus.

Description: On November 9, 2014, the EDG3 monthly load test was being performed using technical specification surveillance procedure, 0PT-12.2C, in which the diesel generator would be started, synched, and loaded locally at the control panel in the diesel room. The non-licensed operator (NLO1) who was manipulating the controls was qualifying for the task under a task performance evaluation (TPE) which was being administered by a long-time qualified non-licensed operator (NLO2) and overseen in the

field by an experienced senior reactor operator (SRO). Once EDG3 was started and all appropriate parameters were established, the SRO went to verify personnel were clear of the switchgear room prior to the operators closing the EDG output breaker. After receiving the all-clear, NLO1 and NLO2 proceeded with the procedure without the SRO having returned from the switchgear room. To synch the generator, NLO1 had one hand on the output breaker switch and one hand on the governor control switch, to raise load after the breaker had closed. NLO1 watched the synchroscope until it was at approximately the 9 o'clock position then looked up at the Output Kilowatt Meter to watch for increasing the load. NLO2 watched the synchroscope until the 11 o'clock position then focused on the hand manipulations of the trainee. NLO1 attempted to close the output breaker when the synchroscope was believed to be at the 12 o'clock position. Immediately there was a loud bang in the room, vibrations felt by the operators from EDG3, and several alarms were received in the control room and locally on the control panel. NLO2 took control of the switches and shut down EDG3 using the Emergency Stop pushbutton.

The steps of synching and loading the EDG were considered "critical steps" in accordance with procedure 0PT-12.2C. A pre-job brief was held earlier that day where defense mechanisms and human performance tools that could be used as barriers to prevent an incident were discussed, such as a dry run of the synch in the field before performing the steps and use of flagging to verify the proper switches were being manipulated. Through interviews after the event, NLO1 indicated knowledge of the importance of synching the generator in-phase but also stated that there was a large emphasis during preparation for the activity of quickly increasing the load on the generator to prevent a reverse power condition. Section 7.3 of 0PT-12.2C contains a caution statement before performing these steps that states, "if load is not raised immediately after closing the generator breaker, the EDG may trip on reverse power," and a note in this section states to perform these steps without delay. However, the procedure directs the steps in this section to be performed in sequence. The steps clearly direct verification of the closing of the EDG onto its emergency bus before proceeding with increasing load on the engine.

The licensee performed an equipment failure investigation immediately following the shutdown of EDG3 and identified some pitting on the collector ring of the EDG, a failed SCR, and a faulted SCR exciter circuit diode. All of these items were repaired/replaced and were all identified to be results of the out-of-synch evolution, not causes. The licensee completed a prompt investigation and a root cause evaluation of the event. Several opportunities for improvement were identified in the areas of operator fundamentals (performing two-handed evolutions), performance of the pre-job brief (appropriate emphasis on the risk-significance of all critical steps in the task and review of applicable OE), training of non-licensed operators and the execution of TPEs, and supervisory oversight of higher risk evolutions.

Analysis: The inspectors determined that the failure to conduct the EDG3 monthly load test in accordance with the prescribed technical specification surveillance test procedure was a performance deficiency. The inspectors determined that the finding was more than minor in accordance with IMC 0612 "Power Reactor Inspection Reports," Appendix B, "Issue Screening," dated September 7, 2012, because it is associated with

the Mitigating Systems Cornerstone attribute of Human Performance, and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, plant personnel performing the local load test on EDG3 manually synched the generator out-of-phase to its corresponding emergency bus, resulting in extended EDG3 inoperability and equipment damage to the collector ring, brushes, and the SCR circuitry. Utilizing IMC 0609, Appendix A, Exhibit 1, effective July 1, 2012, the finding screened as Green by answering "no" to the Mitigating SSC's and Functionality question related to an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for >24 hrs.

The finding had a cross-cutting aspect in the area of Human Performance related to the aspect of Avoid Complacency, in that individuals recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes, and individuals implement appropriate error reduction tools [H.12]. In this event, the operators had an inaccurate risk perception that the evolution of increasing load on the EDG was more critical than synching the generator properly. This was emphasized during the pre-job brief and not identified by the supervisory oversight of the evolution.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, requires, in part, that activities affecting quality shall be accomplished in accordance with instructions, procedures, or drawings appropriate to the circumstances. Contrary to this, on November 9, 2014, the licensee did not conduct the EDG3 monthly load test in accordance with the prescribed technical specification surveillance test procedure, 0PT-12.2C. The corrective actions for this issue are to 1) revise all EDG monthly load test procedures with "cautions" to emphasize the importance of synching the generator properly and performing the steps of the procedure as prescribed; 2) revise operator training lesson plans for performing EDG synching evolutions, as well as guidance on when and how to perform two-handed evolutions; 3) install synch check relays on all manually paralleled generators; and 4) ensure roles and responsibilities are well understood for TPE evaluators and oversight. This violation is being treated as an NCV, consistent with section 2.3.2.a of the Enforcement Policy. The licensee documented this issue in condition report CR 717634. (NCV 05000324/2014005-02, Failure to Follow Emergency Diesel Generator No. 3 Monthly Load Test Surveillance Procedure)

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, 2013, and September 30, 2014 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

- HPCI system
- RCIC system

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152 – 2 samples)

.1 Routine Review

The inspectors screened items entered into the licensee's CAP in order to identify repetitive equipment failures or specific human performance issues for followup. The inspectors reviewed 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 a trend for secondary containment integrity program, but also considered the results of inspector daily condition report screenings, licensee trending efforts, and licensee human performance results. The review nominally considered the 6-month period of July 2014 to December 2014 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.

.3 Annual Followup of Selected Issues

a. Inspection Scope

The inspectors performed a review regarding the licensee's assessments and corrective actions for CR 690721 and Reply to Notice of Violation, EA-14-048, involving the failure of the licensee to promptly identify and correct conditions adverse to quality associated with flood protection of multiple safety-related buildings, as documented in BSEP 14-0075. The inspectors performed the review to ensure that the full extent of the issue was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors also evaluated the CR against the requirements of the licensee's CAP as specified in procedures, CAP-NGGC-0200, Condition Identification and Screening Process; CAP-NGGC-0205, Condition Evaluation and Corrective Action Process; CAP-NGGC-0206, Performance Assessment and Trending; and 10 CFR Part 50, Appendix B. Documents reviewed are listed in the attachment.

b. Findings and Observations

No findings were identified. The inspectors verified that the licensee implemented the corrective actions identified in Reply to Notice of Violation, EA-14-048, and that those actions were appropriate. The following open corrective action items will be reviewed after completion in 2015:

- A review and update, as necessary, of the Brunswick design basis for high winds;
- An effectiveness review performed for the apparent cause evaluation documented in AR 690721, "Apparent Cause for Notice of Violation, EA-14-048"; and
- An effectiveness review performed for the root cause evaluation documented in AR 490292, "4 Day Fuel Oil Tank Enclosure Degradation."

4OA3 Follow-up of Events (71153 – 2 samples)

.1 (Closed) Event Notification (EN) 50459, Loss of Emergency Preparedness Sirens

a. Inspection Scope

For the plant event listed below, the inspectors reviewed plant parameters, reviewed personnel performance, and evaluated performance of mitigating systems. The inspectors communicated the plant events to appropriate regional NRC personnel, and compared the event details with criteria contained in IMC 0309, issued October 28, 2011, "Reactive Inspection Decision Basis for Reactors," for consideration of potential reactive inspection activities. As applicable, the inspectors verified that the licensee made appropriate emergency classification assessments and properly reported the event in accordance with 10 CFR 50.72. The inspectors reviewed the licensee's follow-up actions related to the events to assure that the licensee implemented appropriate corrective actions commensurate with their safety significance. This constitutes one sample. Documents reviewed are listed in the attachment.

- On September 15, 2014, it was determined that the ability to activate the 38 emergency sirens within the 10-mile emergency planning zone (EPZ) was lost. The activation capability was restored within two hours when a loose cable was discovered and replaced. The event did not result in any adverse impact since the county back-up routing was available to notify the public. The licensee wrote CR 708969 to address this event.

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report (LER) 2014-002-00, Secondary Containment Loss of Safety Function Due to Opening in Reactor Building Roof Drain Line and Event Notification (EN) 50046, Loss of Secondary Containment due to Opening in Reactor Building Roof Drain Piping

a. Inspection Scope

On April 20, 2014, the licensee identified pooled water on the floor on the 80-foot elevation of the Unit 2 reactor building. Upon further investigation, a through-wall leak in the Unit 2 reactor building 8-inch roof drain pipe was identified. The leak size was estimated to exceed the maximum allowable margin of the secondary containment pressure boundary, which resulted in secondary containment being considered inoperable per technical specifications. On April 20, 2014, the NRC was notified of the event per Event Notification 50046. On June 19, 2014, the licensee submitted LER 2-2014-002 for a condition prohibited by the plant's technical specifications and that could have prevented fulfillment of the safety function of secondary containment to control the release of radioactive material to the public. On November 17, 2014, an engineering evaluation was completed which performed a more detailed characterization of the affected section of the Unit 2 reactor building roof drain piping. It was determined the leakage area did not exceed the allowable leakage margin and, therefore, secondary containment was still operable and capable of fulfilling its safety function. As a result, LER 2-2014-002 was cancelled on December 4, 2014. The inspectors reviewed the engineering evaluation and did not identify any issues with the retraction of the LER. The licensee's immediate corrective action was to install a patch to seal the leak and is planning to replace the Unit 1 and Unit 2 reactor building roof drain piping in future refueling outages. The licensee entered this issue into the CAP as CR 690674.

b. Findings

No findings were identified.

4OA5 Other Activities

.1 (Closed) URI 05000324; 325/2014004-02, Tornado Protection of the Emergency Diesel Fuel Oil Tank Vent Lines

a. Inspection Scope

The inspectors completed a review of URI 05000324; 325/2014004-02, Tornado Protection of the Emergency Diesel Fuel Oil Tank Vent Lines. On May 8, 2014, during a walkdown, the inspectors noted that the EDG 4-day fuel oil tank vent lines were not protected from tornado-borne missiles. The inspectors questioned the licensee on the whether these vents needed to be tornado-protected, and if so, could they withstand the design basis tornado and rain event. On August 14, 2014, the licensee took corrective actions to place concrete blocks around the vent lines. An engineering evaluation was then performed that identified the worst case design basis tornado and rainfall scenario conditions and what effect those would have on EDG operation. It was determined that with the maximum 24-hour rainfall rate and a tornado missile shearing the ventilation piping at the roof level, the worst case scenario was EDG1 4-day tank filling with water which would be transferred over to the EDG saddle tank. The saddle tank would fill to a level high enough to impact EDG operation in less than two hours. The licensee completed EC 96860 to install concrete barrier pads around the ventilation piping at the 4-day tank roof level to preclude a tornado missile impact at the most vulnerable part of the piping, and also preclude water accumulation on the roof from entering the EDG 4-day tanks. The inspectors reviewed the engineering evaluation, EC, and interviewed engineering personnel to understand the scenario and the impact to plant operation. Documents reviewed are listed in the attachment.

b. Findings

An NRC-identified violation was identified and documented in section 1R15 of this report. This URI is closed.

4OA6 Meetings, Including Exit

An interim exit was conducted on December 12, 2014, by Greg Kolcum to present the inspection results of the focused PI&R sample related to flooding issues to Mr. William R. Gideon and other members of the licensee's staff.

On January 20, 2015, the resident inspectors presented the inspection results to Mr. William R. 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.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

W. Gideon	Vice President
J. Krakuszeski	Plant Manager
K. Allen	Director, Design Engineering
A. Brittain	Director, Nuclear Plant Security
S. Brown	Manager, Nuclear Oversight
K. Crocker	Manager, Nuclear Emergency Preparedness
S. Gordy	Manager, Maintenance
L. Grzeck	Manager, Nuclear Regulatory Affairs
K. Hamm	Superintendent, Mechanical Mnt
R. Heiber	Superintendent, Nuclear Maintenance
J. Hicks	Manager, Nuclear Training
B. Houston	Manager, Nuclear Rad Protection
F. Jefferson	Director, Nuclear Engineering
J. Johnson	Manager, Nuclear Chemistry
J. Kalamaja	Manager, Nuclear Operations
J. Nolin	General Manager, Nuclear Engineering
W. Orlando	Superintendent, E/I&C
A. Padleckas	Assistant Ops Manager, Shift
F. Payne	Manager, Nuclear Work Management
A. Pope	Director, Nuclear Operating Experience
M. Schultheis	Manager, Nuclear Performance Improvement
M. Smiley	Manager, Nuclear Ops Training
R. Wiemann	Director, Electrical/Rx Systems
E. Williams	Superintendent, Nuclear Maintenance

NRC Personnel

G. Hopper	Chief, Reactor Projects Branch 4
J. Dodson	Senior Project Engineer

Attachment

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000324; 325/2014005-01	NCV	Failure to Protect Emergency Diesel Generator 4-Day Fuel Oil Tank Ventilation Piping from Tornado Missiles (Section 1R15)
05000324/2014005-02	NCV	Failure to Follow Emergency Diesel Generator No. 3 Monthly Load Test Surveillance Procedure (Section 1R22)

Closed

Event Notification 50459	EN	Loss of Emergency Siren Activation Capability (Section 4OA3.1)
05000325; 324/2014004-02	URI	Tornado Protection of the Emergency Diesel Fuel Oil Tank Vent Lines (Section 4OA5.2)
05000324/2014-002-00	LER	Secondary Containment Loss of Safety Function Due to Opening in Reactor Building Roof Drain Line (Section 4OA3.2)
Event Notification 50046	EN	Loss of Secondary Containment due to Opening in Reactor Building Roof Drain Piping (Section 4OA3.2)

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

0AP-062, Seasonal Preparations, Revision 2
0AI-68, Brunswick Nuclear Plant Response to Severe Weather Warnings, Revision 46
0OI-01.03, Non-Routine Activities, Revision 52
0AOP-13.0, Operation During Hurricane, Flood Conditions, Tornado, or Earthquake, Revision 59
0AP-025, BNP Integrated Scheduling, Revision 51
0OI-01.01, BNP Conduct of Operations Supplement, Revision 63

Condition Reports

719434 719644 717750 716501 508802

Work Orders

2278473 13321973 1336810

Miscellaneous

Engineering Change 98158, Revision 1

Section 1R04: Equipment Alignment

Procedures

1OP-18, CS Operating Procedure, Revision 60
0PT-10.1.1, RCIC Operability Test , Revision 101
2OP-16, RCIC Operating Procedure, Revision 117

Condition Reports

717215 711561 694261 699950 693620

Work Orders

13301877

Drawings

D-25024, Reactor Building CS Piping Diagram, Sheet 2, Revision 38
D-25024, Reactor Building CS Piping Diagram, Sheet 1, Revision 42
D-02529, RCIC System Piping Diagram Sheet 1, Revision 60
D-02529, RCIC System Piping Diagram Sheet 2, Revision 43
D-02265, Starting Air for Diesel Generators Piping Diagram, Sheet 1B Revision 25
D-02265, Starting Air for Diesels Generators Membrane Dehydrator Detail DG2, Revision 0

D-02270, Piping Diagram Diesel Generator Lube Oil System Sheet 1B, Revision 22
D-02272, Piping Diagram Diesel Generator Jacket Water System Sheet 1B, Revision 16
D-73068, Reactor Building Instrument Air Supply Nitrogen Backup Piping Diagram, Revision 13

Miscellaneous
Engineering Change 97470, Revision 1
SD-16, RCIC System, Revision 12

Section 1R05: Fire Protection
Procedures
0PFP-CB, Control Building Prefire Plans, Revision 11
AD-EG-ALL-1520, Transient Combustible Control, Revision 0
0FPP-005, Fire Watch Program, Revision 34
0PLP-01.1, Fire Protection Program Document, Revision 39
0PLP-01.2, Fire Protection System Operability, Action, and Surveillance Requirements, Rev 44
2PFP-TB, Unit 2 Turbine Building Prefire Plans, Revision 24
0AP-033, Fire Protection Program Manual, Revision 16
BNP-E-9.010, Safe Shutdown Analysis in Case of Fire, Revision 1
0PLP-01.5, Alternative Shutdown Capability Controls, Revision 13
2PFP-RB , Reactor Building Prefire Plans, Revision 15
0PFP-DB, Diesel Generator Building Prefire Plans, Revision 18

Condition Reports
714803

Section 1R06: Flood Protection
Procedures
EGR-NGGC-0351, Condition Monitoring of Structures, Revision 21

Condition Reports

715701	723441	715758	725947	726117	

Work Orders

726808	754225	816727	730093	729970	729986
754236	814113	754226	726805	676109	2091959

Drawings
FS-P-54-0, Turbine Building Drainage Piping Elevation 38'-0", Sheet 109
FSP-00054, Turbine Building Drainage Piping Elevation 38'-0" Piping Line Isometric, Sheet 110
F-02006, Turbine Building Cross-Section "A-A" General Arrangement, Revision 8

Miscellaneous
BNP-PSA-035, PRA Model Appendix F Internal Flooding Analysis, Revision 4
DBD-144, External and Internal Flooding Topical Design Basis Document, Revision 0
System Health Report for Plant Buildings, 3rd Quarter 2014
0BNP-TR-009, Maintenance Rule Structural Walkdown Technical Report, Revision 5

Section 1R07: Heat Sink Performance

Procedures

0CM-HX501, Straight Tube HXs (Cleaning, Plugging, and Replacement of Tubes): Reactor Building Closed Cooling Water and Turbine Building Closed Cooling Water, Revision 16
0PM-HX508, Turbine Building Closed Cooling Water HXs Preventive Maintenance Procedure, Revision 13
0AOP-19, CSW System Failure, Revision 26
MNT-NGGC-0009, Application of Protective Coatings, Revision 7

Condition Reports

715693	724089	724092	634461	720192	722357
722355	723517	723826			

Work Orders

13450219	2212421	2089957	34873	1951769	34875
1951770	35557	1653223	35558	1653224	13410566
13410569	13410568	13410567	13410570	1079267	1653220
34588					

Drawings

D-02041, Piping Diagram Service Water System, Sheet 3, Revision 44
2-FP-02350, Turbine Building Closed Cooling Water Heat Exchangers: 2A, 2B, 2C, Revision A

Miscellaneous

NDE Report #201402745, 2-TCC-2A-HX, October 30, 2014
System Health Report for Unit 1 Secondary Closed Cooling Water, 3rd Quarter 2014
System Health Report for Unit 2 Secondary Closed Cooling Water, 3rd Quarter 2014
Engineering Change 46750, Revision 0
Engineering Change 92267, Revision 0
Engineering Change 92699, Revision 0
BSEP 258-003, Component Cooling Water Heat Exchanger Specification, Revision 0

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

Procedures

0PEP-02.1, Initial Emergency Actions, Revision 52
0PEP-02.6.21, Emergency Communicator, Revision 71
0PEP-02.2.1, Emergency Action Level Technical Bases, Revision 0
AOP-40.0, Security Events, Revision 30
0PEP-02.6.26, Activation and Operation of the TSC, Revision 34
Brunswick Simulator Instruction (SI) SI-216.1, Regulatory Testing, Revision 21
AD-TQ-ALL-0425, Simulator Scenario Based Testing, Revision 1
TAP-412, Simulator Operation and Maintenance, Revision 7
0TPP-206, Simulator Program, Revision 6
TAP-411, Continuing Training Annual/Biennial Exam Development, Administration and Security, Revision 15
0GP-12, Power Changes, Revision 74
1OP-02, Reactor Recirculation System Operating Procedure, Revision 118

1OP-59, Hydrogen Water Chemistry System Operating Procedure, Revision 43
1OP-07, Reactor Manual Control System Operating Procedure, Revision 67
AD-OP-ALL-0203, Reactivity Management, Revision 0

Condition Reports
724378

Miscellaneous
Scenario LOT-EOP-016, Revision 12
Reactivity Manipulation Plan: B1C20 Sequence Exchange, December 19, 2014, Revision 0

Section 1R12: Maintenance Effectiveness

Procedures
ADM-NGGC-0101, Maintenance Rule Program, Revision 24
0PM-BKR008, ITE 4 KV Breaker and Compartment Checkout, Revision 46
0PT-09.10.L, HPCI System Component Local and ASSD Control and Manual Operability Test, Revison 9
0PFO.9.7, HPCI System Valve Operability Test, Revision 32
0MST-HPCI42R, HPCI Suto Acutation and Isolation Logic System Functional Test, Revision 3
0PT-09.2, HPCI System Operability Test, Revision 143

Condition Reports

683123	663204	715187	715789	711340	606837
711341	706435	716198	534364	710390	714286
690292	718214	718230			

Work Orders

2076416	2239244	2110454	2185367	13449657	2299262
1866211	13447672	13405064	13427821	13440432	2074733
13304974	13389012	13442476	1022792	1917903	1660192

Drawings
D-02523, Sheet 2, Revision 53, Reactor Building HPCI System Piping Diagram
D-25023, Sheet 1, Revision 60, Reactor Building HPCI System Piping Diagram

Section 1R13: Maintenance Risk Assessment and Emergent Work Control

Procedures
0AP-060, Technical Task Risk/Rigor Assessment, Revision 0
ADM-NGGC-0006, Online EOOS Model, Revision 8
ADM-NGGC-0104, Work Implementation and Completion, Revision 50
AD-WC-ALL-0410, Work Activity Integrated Risk Management, Revision 0
AD-WC-ALL-0200, Online Work Management, Revision 3
AD-OP-ALL-0201, Protected Equipment, Revision 0
0MST-RHR26Q, RHR system and CS Low Reactor Pressure Permissive Trip Unit, Revision 9
0SMP-FUE501A, Receiving and Handling of New Areva Fuel Assemblies, Revision 11

Condition Reports

715317	715394	715429	715438	715465	715534
715551	715646	723762	723534	722660	722659
722658	715215	721659			

Work Orders

2222574-01	13438293

Miscellaneous

EOOS Risk Assessment, October 27, 2014
Engineering Change 79468, Revision 3
SD-17, RHR System, Revision 19

Section 1R15: Operability Evaluations

Procedures

OPS-NGGC-1305, Operability Determinations, Revision 11
0CM-VCK512, Anchor Darling Swing Check Valve, Revision 22
EOP-03-SCCP, Secondary Containment Control Procedure, Revision 8
1APP-UA-05, Annunciator Procedure for Panel UA-05, Revision 39

Condition Reports

707742	720215	721023	686589	347133

Work Orders

01901030	13458648	13461827	13431130

Drawings

0-FP-84360, 12” 300# Flanged Ends Stainless Steel Swing Check Valve, Revision A
1-FP-04376, Reactor Building 1 Exhaust Fans PCI Room, Sheet 2, Revision X
F-40073, Reactor Building Ventilation System Air Flow Diagram, Sheet 2, Revision 10
LL-08304, Concrete Pad Details for the 4-Day Storage Tank Vent Pipes Tornado Missile Protection; Diesel Fuel Oil Tank Chamber Roof at Elevation 23’-0”, Sheet 760-1, Revision A
LL-08304, Concrete Pad Details for the 4-Day Storage Tank Vent Pipes Tornado Missile Protection; Diesel Fuel Oil Tank Chamber Roof at Elevation 23’-0”, Sheet 760-2, Revision A
LL-08304, Concrete Pad Details for the 4-Day Storage Tank Vent Pipes Tornado Missile Protection; Diesel Fuel Oil Tank Chamber Roof at Elevation 23’-0”, Sheet 760-3, Revision A

Miscellaneous

Temporary Change 0CM-VCK512, Revision 16A
NGG PMB Check Valve template
Original FSAR, dated April 1972
Engineering Change 96860, Revision 0
Engineering Change 98263, Revision 0
DBD-106, Design Basis Document for Hazards Analysis, Revision 1

Section 1R18: Plant Modifications

Procedures

0PT-12.26, Supplemental Diesel Generator Load Test, Revision 0
0SP-EC79694, Supplemental Diesel Generator Tie to Emergency Buses, Revision 1

Miscellaneous

Engineering Change 79694

Section 1R19: Post Maintenance Testing

Procedures

0PLP-20, Post-Maintenance Testing Program, Revision 45
1OP-43, Service Water System Operating Procedure, Revision 118
0SMP-PCV001, Target Rock Series 700-10 Pressure Regulating Valve Adjustment and Flow Test, Revision 7
0OI-03.4, Outside Auxiliary Daily Check Sheets, Revision 170
0PT-02.3.2, Reactor Building to Suppression Chamber Vacuum Breaker Test, Revision 32
0PT-20.8, Nitrogen Backup System Operability Test, Revision 29
0PT-12.2A, DG1 Monthly Load Test, Revision 107
0PM-STU500, Service Water Intake Structure Inspection and Cleaning, Revision 23
MNT-NGGC-009, Application of Protective Coatings Procedure, Revision 7
OPM-STR500, R.P. Adams Self-Cleaning Strainers, Models VWS 10 through 40, Revision 30

Condition Reports

711396	711469	708058	680499	713414	535987
723164	708953	714953	711361	711646	709096
406525	721183	716583	711625	712197	722636
722633					

Work Orders

13435593	13433969	13450687	1935219	13441022	13437731
2197172	1439816	1776265	13442338		

Drawings

D-73068, Reactor Building Instrument Air Supply Nitrogen Backup Piping Diagram, Revision 13
D-20041, Service Water System Piping Diagram, Sheet 2, Revision 56
D-25037, Reactor Building Service Water System Piping Diagram, Sheet 2, Revision 89
D-25037, Reactor Building Service Water System Piping Diagram, Sheet 1, Revision 100

Miscellaneous

Engineering Change 96157
Engineering Change 99042

Section 1R22: Surveillance Testing

Procedures

0PT-12.2C, DG3 Monthly Load Test, Revision 104
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0MST-IRM21FR, IRM Channel F Calibration/Functional Test, Revision 2
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0ENP-16.1, IST Pump and Valve Data, Revision 32
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709200	666095	721015	709947	717634	723090
718115	717886	717887	718323	354019	

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2175638	2179961	2143633	1924531	13438581	13440363
2159497	2159496	41313	42792	13454714	

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6911087	691088	691089	691090	691091	690674
490292	629064	722828	722822	722855	722868
722737					

Work Orders

11652447	11652584	11652428	11652469	11652471	11652477
11652475	11652475	11652456	11652447	11652586	11652446

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Procedures
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0AI-113, Response to Inadvertent Siren Activations or Loss of Activation Capability, Revision 7
0PEP-04.2, Emergency Facilities and Equipment, Revision 40
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708969 708344

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