



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

November 1, 2018

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 05000325/2018003 AND 05000324/2018003; 05000325/2018502 AND
05000324/2018502

Dear Mr. Gideon:

On September 30, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick Steam Electric Plant, Units 1 and 2. On October 18, 2018, 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.

The NRC inspectors did not identify any finding or violation of more than minor significance.

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/

David H. Hardage, Acting Chief
Reactor Projects Branch 4
Division of Reactor Projects

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

Enclosure:
IR 05000325/2018003, 05000324/2018003
05000325/2018502 and 324/2018502

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SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT - NRC INTEGRATED INSPECTION REPORT 05000325/2018003 AND 05000324/2018003; 05000325/2018502 AND 05000324/2018502 dated November 1, 2018.

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DATE		10/22/18	10/18/18	10/18/18	10/18/18	10/24/18
OFFICE	RII:DRS	RII:DRP	RII:DRP	RII:DRP	RII:DRP	
NAME	RCarrion	JZeiler	DJackson	JDodson	DHardage	
DATE	10/18/18	10/18/18	11/1/18	10/29/18	11/2/18	

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

Docket Numbers: 50-325, 50-324

License Numbers: DPR-71, DPR-62

Report Numbers: 05000325/2018003, 05000324/2018003
05000325/2018502; 05000324/2018502

Enterprise Identifier: EPID: I-2018-003-0041
EPID: I-2018-502-0002

Licensee: Duke Energy Progress, LLC

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: Southport, NC

Inspection Dates: July 1, 2018 to September 30, 2018

Inspectors: G. Smith, Senior Resident Inspector
J. Steward, Resident Inspector
S. Sanchez, Senior Emergency Preparedness Inspector
C. Fontana, Emergency Preparedness Inspector
J. Walker, Emergency Preparedness Inspector
A. Goldau, Operations Engineer
J. Zeiler, Senior Resident Inspector, Harris Nuclear Plant
R. Carrion, Senior Reactor Inspector

Approved By: D. Hardage, Acting Chief
Reactor Projects Branch 4
Division of Reactor Projects

Enclosure

SUMMARY

The NRC continued monitoring licensee's performance by conducting a quarterly integrated inspection at Brunswick Steam Electric Plant, Units 1 and 2, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC's program for overseeing the safe operation of commercial nuclear power reactors. Refer to <http://www.nrc.gov/NRR/OVERSIGHT/ASSESS/index.html> for more information.

No findings were identified.

PLANT STATUS

Unit 1 began the inspection period at 100 percent rated thermal power (RTP) and continued to operate there until September 14, when the unit was taken offline due to impending hurricane force winds expected on site due to Hurricane Florence. The unit was maintained shut down during a post-hurricane recovery phase that lasted until September 21. On September 22, the output breaker was closed and the licensee began a power ascension from 22 percent RTP. Due to power restrictions on the grid, power was slowly raised to 100 percent which was achieved on September 30.

Unit 2 began the inspection period at 82 percent RTP. On July 6, from 100 percent RTP, Unit 2 experienced a loss of the 'A' recirculation pump. This resulted in a run back to approximately 50 percent RTP. Following repairs to the 'A' recirculation pump the unit was returned to maximum achievable power of 82 percent RTP on July 9. Between July 10 and July 14, two separate down powers were performed for control rod improvements to 65 and 85 percent RTP on July 11 and July 13, respectively. Following the control rod improvements, power was returned to 100 percent RTP on July 15, where the unit continued to operate until September 1, when power was reduced to 70 percent RTP for a rod pattern adjustment. Following the rod pattern adjustment, a power ascension was commenced and power was returned to 100 percent on September 5. On September 14, due to impending Hurricane Florence, the unit was taken offline. The unit was maintained shut down during a post-hurricane recovery phase that lasted until September 19 when the reactor was taken critical. The output breaker was closed on September 20 and a power ascension was commenced. Due to power restrictions on the grid, reactor power was slowly raised to 94 percent RTP which was achieved on September 26. Reactor power was restricted 94 percent RTP for the remainder of the period due to a failure of one of the offsite power lines as a result of Hurricane Florence.

INSPECTION SCOPES

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

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Impending Severe Weather (1 Sample)

The inspectors evaluated the licensee's readiness for Hurricane Florence impacts from September 12 to September 19, 2018.

71111.04 - Equipment Alignment

Partial Walkdown (3 Samples)

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

- (1) Unit 1, 'A' Standby Gas Treatment System (SBGT) while 'B' train SBGT was out-of-service (OOS) for maintenance on July 3, 2018.
- (2) Emergency Diesel Generator (EDG)-1 while EDG-2 was OOS for planned maintenance on August 1, 2018.
- (3) Unit 2 'B' Residual Heat Removal (RHR)/Core Spray (CS) loop while 'A' RHR/CS loop was OOS for planned maintenance on August 29, 2018.

Complete Walkdown (1 Sample)

- (1) The inspectors completed an evaluation of system configuration during a complete walkdown of the Unit 1 safety-related High Pressure Core Injection (HPCI) system on August 16, 2018.

71111.05AQ - Fire Protection Annual/Quarterly

Quarterly Inspection - 71111.05Q (5 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas between July 6 and September 30:

- (1) Unit 2 Reactor Building (RB) -17' elevation (HPCI Room)
- (2) Unit 1 RB -17' elevation (HPCI Room)
- (3) Unit 1 cable spreading room
- (4) Unit 2 RB 50' elevation
- (5) Unit 2 RB 80' elevation

71111.06 - Flood Protection Measures

Internal Flooding (1 Sample)

The inspectors completed an evaluation of internal flooding mitigation protections in the Unit 1 and Unit 2 HPCI Rooms, RB -17' Elevation on August 15, 2018.

71111.07 - Heat Sink Performance

Heat Sink (Annual) (1 Sample)

On July 11, 2018, the inspectors completed an evaluation of the capability of the Ultimate Heat Sink to reject heat from the plant. This included a visual inspection of: 1) the Intake Canal from Diversion Structure through the service water and circulating water travelling screens, and 2) the Circulating Water Ocean Discharge Pumps and intake screens located at the Caswell Beach pumping station.

Heat Sink (Triennial) (5 Samples)

The inspectors evaluated heat exchanger/sink performance on the following components from July 9 to 13, 2018:

- (1) 1A RHR Heat Exchanger
- (2) 2A RHR Heat Exchanger
- (3) 2B Reactor Building Closed Cooling Water Heat Exchanger
- (4) Diesel Generator No. 2 Jacket Water Cooler
- (5) Ultimate Heat Sink

Sections 02.02.b, 02.02.c, 02.02.d.6, and 02.02.d.7 of inspection procedure 71111.07 were completed

71111.11 - Licensed Operator Requalification Program and Licensed Operator Performance

Operator Performance (1 Sample)

The inspectors observed and evaluated the controlled startup and shutdown of both units between September 13 and September 21, 2018, as a result of Hurricane Florence.

Operator Exams (1 Sample)

The inspectors reviewed and evaluated annual requalification examination results on September 5, 2018.

71111.12 - Maintenance Effectiveness

Routine Maintenance Effectiveness (2 Samples)

On September 30, 2018, the inspectors completed evaluations of the effectiveness of maintenance activities associated with the following equipment and/or safety significant functions:

- (1) CR 2217076, Unit 2 'A' Recirculation pump trip that occurred on July 6, 2018
- (2) CR 2221408, EDG-2 bearing failure on July 29, 2018

71111.13 - Maintenance Risk Assessments and Emergent Work Control (4 Samples)

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

- (1) EDG-2 emergent failure on July 31, 2018
- (2) Battery cell #25 (2B1 battery) emergent failure on August 15, 2018
- (3) Unit 2 'A' RHR Loop Outage on August 31, 2018
- (4) Unit 2 'A' CS pump outage on September 25, 2018

71111.15 - Operability Determinations and Functionality Assessments (6 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) CR 2214510, Prompt Determination of Operability (PDO) of ASCO solenoid valve qualified life on August 1, 2018
- (2) CR 2222696, Maintain the reliability of EDG -1/3 on August 8, 2018
- (3) CR 2193762, Unit 1 'A' CS pump did not load shed during refueling outage LOOP/LOCA testing on August 19, 2018
- (4) CR 2196833, PDO on EDG-2 current transformer on August 21, 2018
- (5) CR 2221576, Wrong wall thickness used in Calculation on August 24, 2018
- (6) CR 2228888, Division I N2 B/U Supply pressure control valve not controlling pressure on September 30, 2018

71111.18 - Plant Modifications (2 Samples)

Between August 1 and September 30, 2018, the inspectors evaluated the following plant modifications:

- (1) Engineering Change (EC) 411708, Change Battery Test Requirements
- (2) EC 402658, Relocate 2A Conventional Service Water pump motor conduit

71111.19 - Post Maintenance Testing (4 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) OCM-ENG519, "Nordberg Emergency Diesel Suggested Engine "Break-In" Schedule," Rev. 16, following replacement of main journal bearings 1 through 10 on August 4, 2018.
- (2) OPT-13.1, "Reactor Recirculation Jet Pump Operability," Rev. 45, following repairs to Unit 1 jet pump no. 4 flow transmitter on September 1, 2018.
- (3) 2MST-BAT11BQ, "125VDC Battery 2B-1 Quarterly Operability Test," Rev. 5 following cell #25 replacement on August 16, 2018.
- (4) OPT-10.1.1, "RCIC System Operability Test," Rev. 107 and OPT-10.1.8, "RCIC System Valve Operability Test," Rev. 40, following preventative maintenance on Unit 2 RCIC Turbine and 2E51-F022, RCIC Pump Bypass to CST Valve on August 24, 2018.

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Routine (4 Samples)

- (1) OPT-13.4, Rev. 2, Reactor Recirculation Jet Pump Operability for Single Loop Ops and OGP-14, Rev. 18, Extended Single Recirculation Loop Ops (related procedures) on July 12, 2018.
- (2) OPT-10.1.8, Rev. 39, RCIC System Valve Operability Test (Unit 2) on July 24, 2018.
- (3) OPT-07.2.4B, Rev. 84, Core Spray System Operability Test – Loop B (Unit 1) on July 26, 2018.

- (4) OPT-01.1.7, Rev. 10, RPS Automatic Scram Contactors Test (Unit 2) during yellow risk on August 2, 2018.

EMERGENCY PREPAREDNESS

71114.01 - Exercise Evaluation (1 Sample)

The inspectors evaluated the biennial emergency plan exercise during the week of July 30, 2018. The exercise scenario simulated a tube rupture on a feed water heater (FWH) resulting in an extraction steam trip. This added positive reactivity, which became the initiating event for fuel damage. A short time later a simulated spurious Main Steam Line Isolation Valve (MSIV) closure occurred resulting in a reactor scram, followed by all reactor control rods inserting. A simulated pressure transient, caused by the MSIV closure, caused a small break Loss of Coolant Accident (LOCA) inside Primary Containment. Drywell pressure increased above 1.7 pounds per square inch gauge (psig). A drywell radiation monitor was simulated to exceed 20,000 rem/hour that indicated a loss of primary containment barrier leading to an offsite radiological release that led to a simulated General Emergency classification. Offsite organizations demonstrated their ability to implement emergency actions.

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

The inspectors evaluated Emergency Action Level (EAL), Emergency Plan (E-Plan), and Emergency Plan Implementing Procedures (EPIP) changes during the week of July 30 - August 3, 2018. This evaluation does not constitute NRC approval of the EALs, E-Plan and EPIPs.

71114.08 - Exercise Evaluation – Scenario Review (1 Sample)

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

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below for the period from July 1, 2017, through June 30, 2018. (7 Samples)

- (1) B101: Unit 1 Reactor Coolant System (RCS) activity
- (2) B101: Unit 2 RCS activity
- (3) B102: Unit 1 RCS leakage
- (4) B102: Unit 2 RCS leakage
- (5) EP01: Drill & Exercise Performance
- (6) EP02: Emergency Response Organization Drill Participation
- (7) EP03: Alert & Notification System Reliability

71152 - Problem Identification and Resolution

Annual Follow-up of Selected Issues (1 Sample)

On September 30, 2018, the inspectors completed a review and evaluation of the licensee's implementation of its corrective action program related to the following issue:

(1) CR 2078244 – Elevated SJAE Rad Monitor Readings

INSPECTION RESULTS

Observation	71152
<p>This issue was chosen as it dealt with a leaking fuel assembly on Unit 1 that was discovered due to elevated steam jet air ejection radiation levels. The pinhole leak was found using eddy current testing during the spring 2018 Unit 1 outage. The leak was noted on only one fuel rod within bundle A21392 and was believed to be caused by either a manufacturing defect or debris-related fretting. There were no findings of significance identified during this review. The inspectors determined that the causal analysis was thorough and that immediate and long term corrective actions appeared to be adequate. The inspectors reviewed these actions and verified that they addressed the cause and were actually being implemented. The inspectors evaluated the following attributes of the licensee's actions:</p> <ul style="list-style-type: none">• complete and accurate identification of the problem in a timely manner• evaluation and disposition of operability and reportability issues• consideration of extent of condition, generic implications, common cause, and previous occurrences• classification and prioritization of the problem• identification of root and contributing causes of the problem• identification of any additional condition reports• completion of corrective actions in a timely manner <p>The inspectors did note that the failed fuel assembly was not in the expected location that was assumed by the flux suppression activities performed for a significant portion of the operating cycle. The inspectors noted that lessons learned from this miscalculation could provide benefits to future flux suppression efforts. This feedback was provided to the licensee.</p>	

EXIT MEETINGS AND DEBRIEFS

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

- On October 18, 2018, the inspectors presented the quarterly resident inspector inspection results to Mr. Randy Gideon, and other members of the licensee staff.

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

0AI-68, Brunswick Nuclear Plant Response to Severe Weather Warnings, Rev. 54
0AOP-13.0, Operation During Hurricane, Flood Condition, Tornado, or Earthquake, Rev. 68

Miscellaneous

DBD-144, External and Internal Flooding, Rev. 0

Section 1R04: Equipment Alignment

Procedures

1OP-10, Standby Gas Treatment System Operating Procedure, Rev. 68
Updated Final Safety Analysis Report, Section 6.5.1.1, Standby Gas Treatment System,
Rev. 25
AD-OP-ALL-0201, Protected Equipment, Rev. 4
2OP-17, Residual Heat Removal System Operating Procedure, Rev. 177
Updated Final Safety Analysis Report, Section 5.4.7, Residual Heat Removal System, Rev. 26

Drawings

F-40073, Reactor Building Standby Gas Treatment Piping Diagram, Sheet 3, Rev. 9
D-02526, Reactor Building Residual Heat Removal System Piping Diagram, Sheet 2A, Rev. 56
D-02526, Reactor Building Residual Heat Removal System Piping Diagram, Sheet 2B, Rev. 81

Section 1R05: Fire Protection

Procedures

CSD-BNP-PFP-2RB, Reactor Building Prefire Plans, Rev. 0
AD-EG-ALL-1532, NFPA 805 Pre-Fire Plans, Rev. 1
0PFP-013, General Fire Plan, Rev. 52
CSD-BNP-PFP-1RB, Reactor Building Prefire Plans, Rev. 1

Section 1R06: Flood Protection

Procedures

0AOP-13.0, Operation During Hurricane, Flood Condition, Tornado, or Earthquake, Rev. 68

Miscellaneous

DBD-144, External and Internal Flooding, Rev. 0

Section 1R07: Heat Sink Performance

Procedures

0ENP-2704, Administrative Control of NRC Generic Letter 89-13 Requirements, Revision 24
0SMP-SWI500, Sodium Hypochlorite Injection to Service Water System, Revision 9
1PM-MEC502, Conventional Service Water Header Inspection, Revision 20
1PM-MEC506, Nuclear Service Water Header Inspection, Revision 16
2PM-MEC501, Nuclear Service Water Header Inspection, Revision 20
2PM-MEC505, Conventional Service Water Header Inspection, Revision 13

Work Orders

WO 01582865, Eddy Current: 2A RHR HT EXCH for License Renewal
WO 01583181, "A" Loop RHR Service Water Piping Inspection
WO 02076096, "A" Loop RHR Service Water Piping Inspection
WO 02104142, 2-RCC-2B-HX: Perform Exchanger Inspection and Cleaning
WO 02105273, 2-MUD-JKT-WTR-CLR-2, Eddy Current DG2 Jacket Water Cooler
WO 02233959, 2A RHR, Perform Drainage, Disassembly, Cleanliness Inspect
WO 13358809, Perform Inspection on 2-RCC-2B-HX Heat Exchanger
WO 13450432-01, Digital Ultrasonic Thickness NDE Report of 2-SW-490-6-045
WO 13450435-02, Digital Ultrasonic Thickness NDE Report of 2-SW-491-6-046
WO 13462961, 2-DG2-ENG - Perform 24-Month MST per 0MST-DG500R
WO 13514578, 2-DG1-ENG, Perform 24-Month MST per 0MST-DG500R
WO 20029798-01, Digital Ultrasonic Thickness NDE Report of 2-SW-131-2-17A
WO 20041267-02, Digital Ultrasonic Thickness NDE Report of 1-SW-492-6-046 / 1-SW-V681 /
1-SW-V685
WO 20062286, Unit 1 & 2 Circ. Water Intake Trash Rack Cleaning
WO 20064086, Unit 1 & 2 Circ. Water Intake Trash Rack Cleaning
WO 20065730-01, Digital Ultrasonic Thickness NDE Report of 1-SW-V96
WO 20066497, Unit 1 & 2 Circ. Water Intake Trash Rack Cleaning
WO 20068699, Unit 1 & 2 Circ. Water Intake Trash Rack Cleaning
WO 20123541-01, Digital Ultrasonic Thickness NDE Report of 2-SW-129-1-17A
WO 20123550-01, Digital Ultrasonic Thickness NDE Report of 2-SW-493-6-046
WO 20127165, 2-DG2-ENG, Perform 72-Month MST per 0MST-DG501R3
WO 20176607, U/1 Outage Conventional Service Water Header Inspection
WO 20213348-01, Digital Ultrasonic Thickness NDE Report of 1-SW-124-2-17A
WO 20215480-01, Digital Ultrasonic Thickness NDE Report of 2-SW-493-6-046

Calculations

G0050C-04, Design Basis Heat Loads from Vital Heat Exchangers

Drawings

BN-43.0.01, Service Water System, Revision 02

System Health Reports

System 2045 – Unit 1 Residual Heat Removal - Q2 2015 through Q2 2018
System 2045 – Unit 2 Residual Heat Removal - Q2 2015 through Q2 2018
System 4060 – Service Water - Q2 2015 through Q2 2018
System 4070 – Unit 1 Primary Closed Cooling Water - Q2 2015 through Q2 2018

System 4070 – Unit 2 Primary Closed Cooling Water - Q2 2015 through Q2 2018
System 4075 – Unit 1 Secondary Closed Cooling Water - Q2 2015 through Q2 2018
System 4075 – Unit 2 Secondary Closed Cooling Water - Q2 2015 through Q2 2018

Corrective Action Documents

Action Request (AR) – 00727873, 1A NSW Pump Strainer Failure
AR – 00739948, Pinhole Leak on Piping Upstream of 2-E11-V221 and 2-E11-V222
AR – 00747185, Replace 2A NSW Pump
AR - 00747712, QCE: Strainer Through-Wall Leak
AR – 00752802, Low Differential Pressure Indicated on 1A RHR Heat Exchanger
AR – 00753611, Nuclear Header SW Piping Corrosion
AR – 02002959, Prompt Determination of Operability
AR – 02005259, 1A Nuclear SW Cooling Water Discharge Line Thru-Wall Leak
AR – 02010051, Investigate and Repair Heavy Corrosion on 1-SW-V299
AR – 02010284, Replace 1-SW-V140 Due to Excessive Corrosion
AR – 02023994, 2A NSW Pump Strainer Higher Than Normal D/P
AR – 02091805, Slight Oil Weepage from 2B RHR Pump Motor
AR – 02093467, Oil Weeping From 2B RHR Pump Motor
AR – 02111883, 2-SW-V183 Seized Closed and Unable to Operate
AR – 02114432, Through-Wall Leak on SW Header Downstream of 1-SW-V15
AR – 02115083, 2-E11-CIS-R001B 2B RHR HX HI Conductivity in Alarm
AR – 02201397, Lack of Funding for RHRSW Motor Cooler ECT Impacting Schedule

Other Documents

1A RHR Heat Exchanger, Service Water Safety Related Heat Exchanger Cleaning/Inspection Data Sheet, dated 4/10/2014
1A RHR Heat Exchanger, Service Water Safety Related Heat Exchanger Cleaning/Inspection Data Sheet, dated 3-22-18
2A RHR Heat Exchanger, Service Water Safety Related Heat Exchanger Cleaning/Inspection Data Sheet, dated 3-16-11
2A RHR Heat Exchanger, Service Water Safety Related Heat Exchanger Cleaning/Inspection Data Sheet, dated 3-8-15
201806, June 2018 Final Report Emergency Diesel Generator Jacket Water Cooler – 2; Emergency Diesel Generator Turbo Inter Cooler - 2
Design Basis Document (DBD)-17, Residual Heat Removal System, Revision 028
DBD-43, Service Water System, Revision 018
DG No. 2 Jacket Water Cooler, Service Water Safety Related Heat Exchanger Cleaning/Inspection Data Sheet, dated 6/9/16
DG No. 2 Jacket Water Cooler, Service Water Safety Related Heat Exchanger Cleaning/Inspection Data Sheet, dated 6/5/18
Service Water Pump Operability Test Information for Nuclear Service Water Pump 1A and 1B, dated 1/27/17
Service Water Pump Operability Test Information for Conventional Service Water Pump 1A, 1B and 1C, dated 1/27/17
Service Water Pump Operability Test Information for Nuclear Service Water Pump 1A and 1B, dated 5/10/17
Service Water Pump Operability Test Information for Conventional Service Water Pump 1A, 1B and 1C, dated 5/10/17

Service Water Pump Operability Test Information for Nuclear Service Water Pump 1A and 1B, dated 9/11/17
Service Water Pump Operability Test Information for Conventional Service Water Pump 1A, 1B and 1C, dated 9/11/17
Service Water Pump Operability Test Information for Nuclear Service Water Pump 1A and 1B, dated 1/16/18
Service Water Pump Operability Test Information for Conventional Service Water Pump 1A, 1B and 1C, dated 1/16/18
Service Water Pump Operability Test Information for Nuclear Service Water Pump 1A and 1B, dated 3/16/18
Service Water Pump Operability Test Information for Conventional Service Water Pump 1A, 1B and 1C, dated 3/16/18
TI Coastal Services, Inc. After Dredge Survey – December 2017; Cross Sections – Stations 164+00 to 179+20, dated December 12, 2017

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

Procedures

0GP-12, Power Changes, Rev. 81
0GP-5, Unit Shutdown, Rev. 185
Unit 2 Operating License and Technical Specifications, Amendment 310
0AOP-36.1, Loss of Any 4160V or 480 E-Buses, Rev. 78
2AOP-04.0, Low Core Flow, Rev. 40
2EOP-01-RSP (Reactor Scram), Rev. 16
2EOP-01-ATWS, Rev. 2
2EOP-01-RVCP (Reactor Vessel Control), Rev.10
0EOP-02-PCCP (Primary Containment Control), Rev.12
0EOP-01-EDP (Emergency Depressurization), Rev. 6
0PEP-02.1, BNP Initial Emergency Actions (EAL-1), Rev. 54
0ENP-24.5, Reactivity Control Planning, Rev. 9
0EOP-01-SEP-10, Circuit Alteration Procedure, Rev.16

Section 1R12: Maintenance Effectiveness

Procedures

AD-EG-ALL-1210, Maintenance Rule Program, Rev. 1

Condition Reports

CR 2217076
CR 2221408

Miscellaneous

Maintenance Rule Database

Section 1R13: Maintenance Risk Assessment and Emergent Work Control

Procedures

0AP-025, BNP Integrated Scheduling, Rev. 56
AD-OP-ALL-0201, Protected Equipment, Rev. 04

0AP-022, BNP Outage Risk Management, Rev. 56
AD-WC-ALL-0250, Work Implementation and Completion, Rev. 04
AD-WC-ALL-0410, Work Activity Integrated Risk Management, Rev. 03
AD-WC-ALL-0200, Online Work Management, Rev. 08
AD-OP-ALL-0201, Protected Equipment, Rev. 04
AD-WC-ALL-0430, Outage Risk Review, Rev. 02

Section 1R15: Operability Determinations and Functionality Assessments

Procedures

AD-OP-ALL-0105, Operability Determinations and Functionality Assessments, Rev. 4
AD-OP-ALL-0100, Corrective Action Program, Rev. 11

Condition Reports

CR 2214510
CR 2222696
CR 2193762
CR 2196833
CR 2221576
CR 2228888

Section 1R19: Post Maintenance Testing

Procedures

0CM-ENG519, "Nordberg Emergency Diesel Suggested Engine "Break-In" Schedule", Rev. 18,
OPT-13.1, "Reactor Recirculation Jet Pump Operability, Rev. 45
2MST-BAT11BQ, "125VDC Battery 2B-1 Quarterly Operability Test," Rev. 5
OPT-10.1.1, "RCIC System Operability Test," Rev. 107
OPT-10.1.8, "RCIC System Valve Operability Test," Rev. 40

Condition Reports

CR 2221408

Work Orders

20273293
20271527
20274472
20203977

Section 1R22: Surveillance Testing

Procedures

OPT-13.4, Reactor Recirculation Jet Pump Operability for Single Loop Ops, Rev. 2
0GP-14, Rev. 18, Extended Single Recirculation Loop Ops, Rev. 18
OPT-10.1.8, RCIC System Valve Operability Test, Rev. 39,
OPT-07.2.4B, Rev. 84, Core Spray System Operability Test – Loop B, Rev. 84
OPT-01.1.7, RPS Automatic Scram Contactors Test (Unit 2), Rev. 10

Section 1EP1: Exercise Evaluation

Procedures

OERP, Radiological Emergency Response Plan, Rev. 91
AD-EP-ALL-0100, Emergency Response Organization, Rev. 1
AD-EP-ALL-0100, Emergency Response Organization, Rev. 1
AD-EP-ALL-0101, Emergency Classification, Rev. 1
AD-EP-ALL-0103, Activation and Operation of the Emergency Operations Facility, Rev. 1
AD-EP-ALL-0104, ERO Common Guidelines and Forms, Rev. 1
AD-EP-ALL-0105, Activation & Operation of the Technical Support Center, Rev. 1
AD-EP-ALL-0109, Protective Action Recommendations, Rev. 3
AD-EP-ALL-0202, Emergency Response Offsite Dose Assessment, Rev. 6
AD-EP-ALL-0204, Distribution of Potassium Iodide Tablets in the Event of a Radioiodine Release, Rev. 2
AD-EP-ALL-0304, State and County Notifications, Rev. 1
AD-EP-ALL-0802, Conducting Drills and Exercises, Rev. 4
OERP, Radiological Emergency Response Plan (ERP), Rev. 91
OPEP-02.1.1, Emergency Control – Unusual Event, Alert, Site Area Emergency, and General Emergency, Rev. 30
OPEP-02.2.1, Emergency Action Level Technical Bases, Rev. 9
TE-EP-ALL-0407, Verification of Emergency Operations Facility Communication Equipment Operation and Equipment/Supply Inventory, Rev. 2

Records and Data

BNP-EP-EX-18-01, Brunswick Biennial Exercise Scenario, July 31, 2018
Brunswick Nuclear Plant Evaluated Exercise 2018 Management Debrief package.
Self-Assessment and Benchmark Programs, AD-PI-ALL-0300, Attachment 2, pp. 1-17, titled: "2018 BNP EP Program NRC Biennial Exercise Readiness Pre-Assessment for NRC IP, dated July 19, 2018"
Control Room Simulator, Operations Support Center, Technical Support Center, and Local Emergency Operations Facility/Joint Information Center - Documentation packages (logs, Event Notification Forms, Protective Action Recommendations, Media Releases, and Radiological Dose Assessments)

Corrective Action Program Documents (Condition Reports)

NCR 02221854, ERONS activation email late
NCR 02221913, ERO Bridge lines issues
NCR 02222003, EOF news writer not qualified
NCR 02222012, Mission board needs priorities column
NCR 02222089, EOF new writer did not have procedure checklist
NCR 02222170, Brunswick EPNET radiological release discrepancy
NCR 02222301, NRC EP Inspection DEP KPI error in 4th QTR. 2017
NCR 02222328, Brunswick release pathway criteria not met

Section 1EP4: Emergency Action Level and Emergency Plan Changes

Procedures

0ERP, Radiological Emergency Response Plan, Rev. 89 & 90

0ERP, Radiological Emergency Plan (ERP), Rev. 91

AD-EP-ALL-0101, Emergency Classification, Rev. 1

Change Packages

50.54(q) Screening Evaluation Form for 0ERP Radiological Emergency Response Plan Rev. 91, dated July 19, 2018

50.54(q) Effectiveness Evaluation Form for 0ERP Radiological Emergency Response Plan Rev. 91, dated July 24, 2018

10 CFR 50.54(q) Screening Evaluation Form for 0ERP Radiological Emergency Response Plan Rev. 90, dated September 24, 2017

10 CFR 50.54(q) Effectiveness Evaluation Form for 0ERP Radiological Emergency Response Plan Rev. 90, dated September 24, 2017

10 CFR 50.54(q) Screening Evaluation Form for AD-EP-ALL-0101 Rev. 1, dated January 31, 2018

10 CFR 50.54(q) Effectiveness Evaluation Form for AD-EP-ALL-0101 Rev. 1, dated January 31, 2018

Corrective Action Program Documents (Condition Reports)

AR 02171226, Complete 50.54(q) Screening in accordance with AD-EP-ALL-602

AR 02210143, Complete 50.54(q) Evaluation in accordance with AD-EP-ALL-602

AR 02219956, AD-EP-ALL-062 revised EREG on 0ERP, Rev. 91

Section 1EP8: Exercise Evaluation

Procedures

0PEP-03.8.2, Personnel Accountability and Evaluation, Rev. 24

0PEP-03.6.3, Estimate of Extent of Core Damage Under Accident conditions – Core Damage Assessment Program (CDAM), Rev. 23

AD-EP ALL-0202, Emergency Response Offsite Dose Assessment, Rev. 6

AD-EP-ALL-0103, Activation and Operation of Emergency Operations Facility, Rev. 1

AD-EP-ALL-0105, Activation and Operation of Technical Support Center, Rev. 1

AD-EP-ALL-0106, Activation and Operation of Operations Support Center, Rev. 1

AD-EP-ALL-0103, Activation and Operation of Joint Information Center, Rev. 1

AD-EP-ALL-0801, Design and Development of Drills and Exercises, Rev. 4

AD-EP-ALL-0803, Evaluation and Critiques of Drills and Exercises, Rev. 4

Records and Data

8-year cycle list of drills and exercises, 2014-2021, and 2022-2029

BNP-ERO Drill 16-03, Critique report for September 30, 2016

BNP-ERO Drill 16-11, Critique report for October 12, 2016

BNP-ERO Drill 16-12, Critique report for November 25, 2016

BNP-ERO Drill 17-01, Critique report for December 2, 2017

BNP-ERO Drill 17-02, Critique report for May 14, 2017

BNP-ERO Drill 17-03, Critique report for October 16, 2017

BNP-ERO Drill 17-07, Critique report for July 31, 2017

BNP-ERO Drill 18-01, Critique report for March 9, 2018
BNP-ERO Drill 18-02, Critique report for May 13, 2018
BNP July 26, 2016 Exercise Scenario Self-Assessment number 2172884, 2018 BNP
Emergency Preparedness Program NRC Biennial Exercise Readiness Assessment for NRC
IP 71114 Inspection, May 17, 2018
FEMA Final After Action Report for Brunswick Nuclear Plant Radiological Emergency
Preparedness Exercise, Exercise date: July 26, 2016, report dated: April 5, 2017

Section 40A1: Performance Indicator Verification

Procedures

AD-EP-ALL-0001, Emergency Preparedness Key Performance Indicators, Rev. 1
AD-EP-ALL-0002, NRC Regulatory Assessment Performance Indicator Guideline Emergency
Preparedness Cornerstone, Rev. 1
AD-EP-ALL-0803, Evaluation & Critique of Drills & Exercises, Rev. 0
AD-LS-ALL-004, NRC Performance Indicators and Monthly Operating Report, Rev. 2
AD-RP-ALL-1101, Performance Indicators (PI) for the Occupational and Public Radiation
Cornerstones, Rev. 0
REG-NGGC-0009, NRC Performance Indicators and Monthly Operating Report Data, Rev. 15
AD-LS-ALL-004, NRC Performance Indicators and Monthly Operating Report, Rev. 1
AD-RP-ALL-1101, Performance Indicators (PI) for the Occupational and Public Radiation
Cornerstones, Rev. 0

Miscellaneous

Operator narrative logs from 2018

Records and Data

DEP opportunities documentation for 3rd and 4th quarters 2017, & 1st and 2nd quarters 2018
Siren test data for 3rd and 4th quarters 2017, & 1st and 2nd quarters 2018
Drill & exercise participation records of ERO personnel for 3rd and 4th quarters 2017, & 1st and
2nd quarters 2018

Section 40A2: Problem Identification and Resolution

Procedures

AD-HU-ALL-0001, Human Performance Program, Rev. 12
AD-PI-ALL-0100, Corrective Action Program, Rev. 18
AD-PI-ALL-0101, Root Cause Evaluation, Rev. 04
AD-PI-ALL-0102, Apparent Cause Evaluation, Rev. 04
AD-PI-ALL-0103, Quick Cause Evaluation, Rev. 04
AD-PI-ALL-0400, Operating Experience Program, Rev. 05