



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**

REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

November 22, 2017

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

**SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT – U. S. NUCLEAR REGULATORY
COMMISSION EVALUATION OF CHANGES, TESTS, AND EXPERIMENTS
AND PERMANENT PLANT MODIFICATIONS INSPECTION REPORT
05000325/2017008 AND 05000324/2017008**

Dear Mr. Gideon:

On October 20, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Brunswick Unit 1 and 2 facilities, and discussed the results of this inspection with you and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

The NRC inspectors did not identify any findings or violations of more than minor significance.

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/

Shakur A. Walker, Chief
Engineering Branch 1
Division of Reactor Safety

Docket Nos.: 05000325, 05000324
License Nos.: DPR-71, DPR-62

Enclosure:
Inspection Report 05000325/2017008
and 05000324/2017008
w/Attachment: Supplemental Information

cc: Distribution via Listserv

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT – U. S. NUCLEAR REGULATORY COMMISSION EVALUATION OF CHANGES, TESTS, AND EXPERIMENTS AND PERMANENT PLANT MODIFICATIONS INSPECTION REPORT 05000325/2017008 AND 05000324/2017008 dated November 22, 2107

Distribution:

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* see previous page for concurrence

PUBLICLY AVAILABLE NON-PUBLICLY AVAILABLE SENSITIVE NON-SENSITIVE
 ADAMS: Yes ACCESSION NUMBER: _____ SUNSI REVIEW COMPLETE FORM 665 ATTACHED

OFFICE	RII:DRS	NRO	RII:DCO	RII:DRS	RII:DRS	RII: DRP
	TXS2	JXH19	RXM1 FOR PJC2	DWS5	SAW4	SDR2
NAME	T. SU	J. HEATH	P. CARMAN	D.STRICKLAND	S. WALKER	S. Rose
DATE	11/21/2017	11/14/2017	11/15/2017	11/14/2017	11/22/ 2017	11/16/2017
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: S:\DRS NEWENG BRANCH 1\BRANCH INSPECTION FILES\2017-2018-2019 CYCLE INSPECTION FOLDER FOR ALL SITES\50.59 INSPECTIONS\BRUNSWICK\BRUNSWICK 50.59 MODS INSPECTION RPT (2017008).DOCX

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-325, 50-324

License Nos.: DPR-71, DPR-62

Report Nos.: 05000325/2017008, 05000324/2017008

Licensee: Duke Energy Progress, Inc.

Facility: Brunswick Steam Electric Plant, Units 1 & 2

Location: 8470 River Road, SE
Southport, NC 28461

Dates: October 16 – October 20, 2017

Inspectors: T. Su, Senior Reactor Inspector (Team Leader)
J. Heath, Reactor Operating Engineer
P. Carman, Construction Inspector
D. Strickland, Reactor Inspector (Trainee)

Approved by: Shakur A. Walker, Chief
Engineering Branch 1
Division of Reactor Safety

Enclosure

SUMMARY

Inspection Report (IR) 05000325/2017008, 05000324/2017008; 10/16/2017 – 10/20/2017; Brunswick Steam Electric Plant, Units 1 & 2; NRC Evaluations of Changes, Tests, and Experiments and Permanent Plant Modifications.

The inspection activities described in this report were performed between October 16, 2017 to October 20, 2017, by three Nuclear Regulatory Commission (NRC) inspectors from Region II and one inspector from NRC Headquarters. No findings were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R17 Evaluations of Changes, Tests, Experiments and Permanent Plant Modifications (71111.17T)

a. Inspection Scope

Evaluations of Changes, Tests, and Experiments: The team reviewed six safety evaluations performed pursuant to Title 10, *Code of Federal Regulations* (CFR) 50.59, "Changes, tests, and experiments," to determine if the evaluations were adequate and that prior NRC approval was obtained as appropriate. The team also reviewed 20 screenings and/or applicability determinations where licensee personnel had determined that a 10 CFR 50.59 evaluation was not necessary. The team reviewed these documents to determine if:

- The changes, tests, or experiments performed were evaluated in accordance with 10 CFR 50.59 and that sufficient documentation existed to confirm that a license amendment was not required;
- The safety issues requiring the changes, tests or experiments were resolved;
- The licensee conclusions for evaluations of changes, tests, or experiments were correct and consistent with 10 CFR 50.59; and
- The design and licensing basis documentation used to support the change was updated to reflect the change.

The team used, in part, Nuclear Energy Institute (NEI) 96-07, "Guidelines for 10 CFR 50.59 Implementation," Revision 1, to determine acceptability of the completed evaluations and screenings. The NEI document was endorsed by the NRC in Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," dated November 2000.

This inspection constituted six samples of evaluations and 20 samples of screenings and/or applicability determinations as defined in Inspection Procedure (IP) 71111.17-05.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On October 20, 2017, the team presented inspection results to Mr. W. Gideon and other members of the licensee's staff. The team 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, Site Vice President
T. Sherrill, Reg. Affairs
M. Turkal, Acting Reg. Affairs Manager
L. Grzeck, Manager - Licensing
K. Moser, Plant General Manager
J. Nolin, Engineering General Manager
K. Allen, Director Eng. - Design
N. Smith, I&C Design Manager
G. Grosch, Lead I&C Design Engineer
B. Ginsberg, Hardened Vent SME

NRC Personnel

G. Smith, Senior Resident Inspector, Brunswick
M. Schweig, Resident Inspector, Brunswick
J. Steward, Resident Inspector, Brunswick

LIST OF ITEMS OPENED, CLOSED, DISCUSSED AND UPDATED

Opened and Closed

None.

LIST OF DOCUMENTS REVIEWED

10 CFR 50.59 Evaluations

AR 669364, 50.59 Evaluation for EC 94834 Station Battery Service Test Load Profile Change, Dated 2/18/14
EC 059731, U1, Removal of Reactor Building Standby Air Compressors, AR 713531
EC 01970919, Evaluation for Replace EDG Exciter/Voltage Regulator Child 5 Install Bakelite in Exciter Cabinet for DG 3
EC 299850-R001, U2, 5095, Replace EDG Exciter / Voltage Regulator Child 5 Install Bakelite in Exciter Cabinet For DG3, AR 01970919, Evaluation
EC 300888, Allen Bradley 700RTC Relay Digital change, AR 1989883
EC 300785 U2 Fuel Zone Water Level Density Compensation and Replacement of 2-B21-LI-R610 and 2-B21-LR-R615, Rev. 6, AR 2070882
EC 300785-R006, U2, 1005 Fuel Zone Water Level Density Compensation and Replacement Of 2-B21-LI-R610 AND 2-B21-LR-R615 (Master EC), AR 02031186
EC 95350, U1&2, Increase of E11-F008 Stroke Time, AR 707238 Evaluation

10 CFR 50.59 Screenings

AR 1989663, Screening for Allen Bradley 700RTC relay EC
AR 2070900, 50.59 screen for EC 300785
AR 437844, 50.59 screen for EC 277112
AR 612522, Screening for EC 292338 to add backup nitrogen supply capacity to HCVS
AR 714164, 50.59 Screen for EC 94834, dated 10/31/14
EC 1970919, Screen for Replace EDG Exciter/Voltage Regulator CHILD 5 Install Bakelite in Exciter Cabinet for DG 3, Rev. 21
EC 252759-R010, U1, Master U1/U2 HPCI/RCIC Drain Piping Upgrade, 05-734, AR 244329
EC 266023-R001, U2, Repair Of Condensing Unit 1-VA-1D-CU-CB, 2-VA-2D-CU-CB, 2-VA-2E-CU-CB, AR 02086973, Screening
EC 276939, Unit 1 Alternate Decay Heat Removal – Second Loop, AR 509792
EC 277112, Alternate Replacement of NLI 1000VA Inverters, Rev. 2, AR 00437844
EC 278861, Replacing SSPV on Unit 1 and Unit 2, AR 726325
EC 285901-R001, U1, Removal Of Pipe Support PS-3633 Affects The Pipe Stresses On LINE1-E21-701-3/4-603, AR 00681066, Reviews
EC 286085-R003, U1, Replacement For Valve 1-E51-F008, AR 00529737, Reviews
EC 290408-R013, U2, Unit 2 Hardened Containment Vent System Upgrades In Response To EA 13-109 (MECHANICAL) FUKUSHIMA, AR 01998894
EC 293405-R002, U1, Relocate 1B RHR High Point Vent See LTAM Concern BNP-13-0041, 00654291, Reviews
EC 294764-R010, U1, NFPA 805 MOD 8B - FP Diesel FO Storage Vent And Mounting STEEL, AR 02066741
EC 296885, HPCI Turbine Steam Supply Valve Replacement, AR 074029
EC 299231, APRM and EPROM upgrades in support of MELLLA+, AR 1945800 Screening
EC 403911, B2C23 Core Reload Design, AR 2077472
EC 404628-R003, U2, Replace A Pipe Spool For Pipe Line Number 2-SW-103-24-157 Between Valves 2-SW-V104 And 2-SW-V105, AR 02055746
EC 408144-R003, U2, Reactor Pressure Vessel N9 Nozzle Weld Overlay B223R1, AR 02113160
EC 92338, Add capacity to the Unit 1 nitrogen backup system for HCVS, Rev 4, AR 612522

EC 94179, Replace HPCI Turbine Steam Admission Valve on 2-E41-F001 on BNP Unit 2, AR 673143

EC 94834, Updating the DC System Load Calculation BNP-E-6.120 and revising the battery surveillance capacity tests for Unit 1, Rev. 1, AR 00714164

Applicability Determinations:

AR 1945793, Applicability Determination for APRM EPROM Upgrade to Support MELLLA+
AR 1949846, Applicability Determination for Revision to OOP-39- Diesel Generator Operating Procedure

AR 1951164, Applicability Determination for 2PT-34.5.3.2

AR 1989651, Applicability Determination for EC 300888 - 000 Allen Bradley 700RTC Digital Component Change

AR 2031184, Applicability Determination for EC300785, dated 7/11/16

AR 731755-02, Fire Protection Impact Considerations for EC0088258R2

Procedures

OOP-39, Diesel Generator Operating Procedure, Rev. 165

OOP-39, Diesel Generator Operating Procedure, Rev. 166

OPT-20.8, Nitrogen Backup System Operability Test, Rev. 29

OPT-31.8, Backup Nitrogen Check Valve Operability Test, Rev. 2

1MST-BAT11DFY, 125 VDC Battery 1B-2 Modified Performance Capacity Test, Rev. 5

1MST-BAT11DR, 125 VDC Battery 1B-2 Service Capacity Test, Rev. 6

1MST-PCIS43R, PCIS Group 8 Isol. Logic Sys. Func. Test and RHR Assd. Test, Rev. 6

1MST-RPS24R, RPS Reactor Vessel Low Water level Trip Unit Chan. Cal. Rev. 19

1MST-RPS24Q, RPS Reactor Vessel Low Water level Trip Unit Chan. Cal. Rev. 6

2PT-34.5.3.2, HPCI High Pressure CO2 Operability Test, Rev 23

AD-EG-ALL-1125, Qualification of Seismically Insensitive and Seismically Rugged Parts, Rev. 0

AD-EG-ALL-1612, Environmental Qualification (EQ) Program, Rev. 1

EGR-NGGC-0007, Maintenance of Design Documents, Rev. 12

NEI 13-02, Industry Guidance for Compliance with Order EA-13-109, Rev. 1

Drawings

1-FP- 85300, Piping Diagram, Reactor Building Alternate Decay Heat Removal to Aux Fuel Pool Cooling System, 2/21/12

BN-19.0.1, System Flow Diagram, HPCI System, Rev 4

C-09-55938-01, Double Disc Gate Valve Stainless Steel, Welded Ends with Limitorque SB-00 Actuator, Size 3 Class 1200, Rev. B

D-02537, Reactor Building Service Water System Piping Diagram, Sheet 2, Rev. 93

D-07029, Reactor Building Instrument Air Supply System Piping Diagram, Sheet 2A, Rev. 48

D-07029, Reactor Building Instrument Air Supply System Piping Diagram, Sheet 2B, Rev. 45

D-25017, Piping Diagram, Reactor Building Control Rod Drive Hydraulic System, Rev. 25

Calculations

OB11-0023, Weld Residual Stress Analysis of the Capped Control Rod Drive Hydraulic System Return Nozzle (N9) with Weld Overlay Repair, Rev. 1

0HPCI - 0011, HPCI Response Time Requirement, Rev. 1

ORNA-0001, Instrument Air Nitrogen Backup System Volume Requirements, Rev 4.

248-117, Installation of Piping Systems, Rev. 40

84-196-231, Design Analysis for IAN to IAI Conversion for IAN System Upgrade, Rev. 0

95135 - 6 - 104, Design Report Weak Link Analysis for MOV's E41 - F001, Rev. 0

ANP – 3560P, Brunswick Unit 2 Cycle 23 Reload Safety Analysis, Rev. 0
 BNP-E-6.120, 125/250 VDC System Battery Load Study, Rev 4
 BNP – MECH – E41 – F001, Mechanical Analysis and Calculation for ½ - E41 – F001 HPCI Turbine Steam Admission Valve, Rev. 7
 PS-E51-533, RCIC System ISO 533 Pipe Support Qualification, Rev. 2
 PT-A25.2.7, Periodic Test, Reactor Low Level #1 Response Time, Rev. 7
 PT-A25.3, Periodic Test, Reactor Low Level #1 Response Time, Rev. 4
 RNP-C/EQ-1335, Weak Link Analysis MOV(s), Rev. 4
 SA-SW-250-255, Copper Nickel Pipe Replacement for Line 2-SW-106, -107, -108, Rev. 5
 SA-E51-533, Pipe Stress Analysis of ISO 533, Rev. 2

Completed Procedures

OPT – 0.1.1.C, RPS Manual Scram Test, Performed 4/8//12
 OPT – 09.7, Unit 1 HPCI System Valve Operability Test, Performed July 2017
 OPT – 09.7, Unit 2 HPCI System Valve Operability Test, Performed July 2017
 OPT – 12.1 C, No. 3 DG LOOP/LOCA Loading Test, Performed 4/10/2017
 OPT – 12.2 C, No. 3 DG Monthly Load Test, Performed 10/8/17
 OPT – OPT – 14.2.1, Single Rod Scram Insertion Times Test, Performed 9/6/12

Corrective Action Documents

AR 00708580	NCR 740827
CR 630621	1959517
CR 738272	1984990
NCR 738272	755850

UFSAR

UFSAR Section 1.2.2.1.2, Reactor Core and Control Rods
 UFSAR Section 3.9.4.1.3, Control Rod Drive System Operation
 UFSAR Section 5.1, Reactor Coolant System and Connected Systems Summary Description
 UFSAR Section 6.2.4, Containment Isolation System
 USAR Section 7, Appendix 7A, Instrumentation Channel Sensors
 UFSAR Section 8.3.1.1.6.2.8, Fuel Oil System
 UFSAR Section 9.3.1, Compressed Air System
 UFSAR Change Summary Form 16FSAR-033, Dated 8/15/2017

Miscellaneous Documents

LDCR #15FSAR-004, FSAR revisions as a result of EC 88258R2
 AZZ/NLI QR-09314565-1, Qualification Report for Time Delay Relays Allen Bradley P/N: 700-RTC00200U1 and 700-RTC01200U1, Rev. 0
 AZZ/NLI QR-093145675-1, Allen Bradley 700RTC Seismic Qualification Report for Fort Calhoun, Rev. 0, dated 3/9/11AZZ/NLI VRR-700RTC-01, Commercial Grad Dedication/Verification and Validation Report, Rev. 0, dated 1/22/16
 AZZ/NLI QR-700RTC-1, EMI/RFI Qualification Report for Allen-Bradley Relay Model: 700RTC, Rev.1, dated 4/4/16
 BSEP 14-0093, Summary of 50.59 evaluations, dated August 14, 2014
 Contract #03004829, Duke Purchase Order to Rockwell Automation Inc. for services to support NLI V&V plan for 700RTC Allen Bradley 700RTC timing relay, Dated 9/9/15
 Design Basis Document No.19, Brunswick Nuclear Plant - High Pressure Coolant Injection, Rev. 22

Design Basis Document No. 46, Instrument & Service Air Systems, Rev. 17
 Design Basis Document No. 51, Brunswick Nuclear Plant – DC Electric System, Rev. 8
 Design Report No. DR – 225, HPCI Steam Supply Valve, Rev. 2
 DPC Audit/Survey#: VA15003, Duke Acceptance of Altran Audit/Survey, dated 12/7/15
 DR-227, Environmental Qualification Service Condition, Rev. 20
 EC 270989, DG Voltage Regulator/Exciter System Replacements, Rev. 55
 EC 276939, Unit 1 Alternate Decay Heat Removal – Second Loop, Rev. 100
 EC 296885, HPCI Turbine Steam Supply Valve Replacement, Rev. 4
 EC 299915, Diesel Generator (DG) RCR-X Relay Surge Suppression, Rev. 2
 PO 3004829, AB 700-RTC Relay Qualification Audit, dated 9/9/15
 EC 403911, B2C23 Core Reload Design, Rev. 4
 EC 66594, Install Transorb across Allen-Bradley Type P, Rev. 0
 EC 78865, Replacing SSPV on Unit 1 and Unit 2, Rev 15
 EC 86085R0 Attachment Z04, RCIC Steam Supply to RCIC Turbine Adlpipe Stress Analysis, R0
 EC 94179, Replace HPCI Turbine Steam Admission Valve on 1-E41-F001 on BNP Unit 1, Rev 22
 EC 94179, Replace HPCI Turbine Steam Admission Valve on 2-E41-F001 on BNP Unit 2, Rev 3
 EC 97827, Document Responses to GE Design Input Request DBR-0000778, Rev. 0
 EC 99915, Add Transient Voltage Suppressor electrically GE Type HFA relays, Rev.2
 EPRI TR-102323, Guidelines for Electromagnetic Interference Testing in Power, Rev. 3
 EPRI TR-106439, Guideline on Evaluation and Acceptance of Commercial Grade Digital Equipment for Nuclear Safety Applications, Dated 10/96
 GEZ-7029-A, Qualification Report for GE PSMBD relays, Rev. 9/25/81
 HCVS-WP-02, Sequences for HCVS Design and Method for Determining Radiological Dose from HCVS Piping, Rev.0, dated 10/23/14
 Letter, BSEP 16-0069, Brunswick Updated Final Safety Analysis Report, Revision 25, Dated August 11, 2016
 Letter, Brunswick Steam Electric Plant Unit Nos, 1 and 2, Report of 10 CFR 50.59 Evaluation and Commitment Changes, Dated August 14, 2014
 Letter, dated May 9, 2017, Brunswick Steam Electric Plant, Unit 2 – Verbal Authorization of Relief Request for Reactor Vessel Closure Head Penetration Nozzle N9 Repair (CAC No. MF9561)
 Letter, dated October 10, 2017, Brunswick Steam Electric Plant, Unit 2 – Relief from the Requirements of the ASME Code, Section XI, IWA-4000 (In-service Inspection Program Alternative ISI-07) (CAC No. MF9561)
 Letter, Issuance of Amendment No. 184 to Facility Operating License No. DRP-71 and Amendment No. 215 to Facility Operating License No. DRP-62, Regarding Instrumentation Response Time Testing – Brunswick Steam Electric Plant, Units 1 and @ (TAC NOS M98218 and M98219), Dated April 18, 1997
 Letter, Issuance of Exemption of 10 CFR 50.71 (e)(4), Brunswick Stem Electric Plant Units 1 and 2 (TAC NOS. M92761 and M92762), Dated December 21, 1995
 ML14358A040, NRC endorsement of NEI white paper HCVS-WP-02, dated 2/5/15
 NEDO-32291-ASupplemental 1, BWROG, Licensing Topical report, System Analyses for the Elimination of Selected Response Time Testing Requirements, Dated October 1999
 NEI 01-01, Guideline on Licensing Digital Upgrades, Rev. 1

NTS Test Report No. TR9072S-06N, Seismic Qualification Report for Yokogawa Dx Advanced Series Recorders, Rev. 3, dated 7/8/10
NTS Report #: TR90725-06N-2, Test Report for Software/Firmware Validation of Yogogawa DX Advanced Series Recorders, Rev.5, dated 09/03/13
NUPIC Audit/Survey # 23896, NUPIC Joint Audit of Altran Solutions Corporation, dated 10/28/15
QDP – 93B, Qualification Data Package for Scram Solenoid Pilot Valve, Rev. 3
QR 72034-1, Qualification Report for NLI Inverter Assembly P/N NLI-072034-CSI-K-5-A, Rev. 1, dated 2/3/04
Rains 05-734, R0 for EC 52759, Replacing Carbon Steel Pipe, Rev. 0
SD-03, System Description, Reactor Protection System Including Alternate Rod Injection System, Rev. 12
Vendor Manual No. FP – 61761, Valves and Operators, Rev. 14
Vendor Manual No. FP – 86698, EDG Excitation System, Rev. 14
Vendor Manual No. FP – 87721, Crane Sentinel Bolted Bonnet Gate Valve, Rev. 14
VVR-15412407-1, Software V&V Report for ABSOPULSE CSI 1000 Series Inverter P/N CSI-K-B-Q9573, Rev. 0, dated 4/15/10

Work Orders

WO 13408537, 2MST-RHR24R RHR RX Vessel Shroud Level Instrument Cal.

Condition Reports (NCRs) generated as a result of the inspection

CR 2159081, NRC 50.59 Inspection UFSAR Discrepancy
WR 20087327, Stripped Screw on Door Latch Cover