



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

January 12, 2017

Mr. George A. Lippard, III
Vice President - Nuclear Operations
South Carolina Electric & Gas Company
Virgil C. Summer Nuclear Station
P.O. Box 88, Mail code 800
Jenkinsville, SC 29065

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION - NRC EVALUATION OF CHANGES,
TESTS, AND EXPERIMENTS AND PERMANENT PLANT MODIFICATIONS
INSPECTION REPORT 05000395/2016008

Dear Mr. Lippard:

On December 9, 2016, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Virgil C. Summer Nuclear Station, Unit 1, and 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 and its enclosure 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/

Jonathan H. Bartley, Chief
Engineering Branch 1
Division of Reactor Safety

Docket No.: 50-395
License No.: NPF-12

Enclosure:
Inspection Report 05000395/2016008
w/Attachment:
Supplemental Information

cc: Distribution via Listserv

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☒ PUBLICLY AVAILABLE ☐ NON-PUBLICLY AVAILABLE

☐ SENSITIVE ☒ NON-SENSITIVE

ADAMS: ☒ Yes ACCESSION NUMBER: _____

☒ SUNSI REVIEW COMPLETE ☐ FORM 665 ATTACHED

OFFICE	RII:DCP	RII:DRS	RII:DCP	RII:DRS	RII:DRP	RII: DRS
SIGNATURE	PAB3	CAF4	DWP2	GKO	ADM2	JHB1
NAME	P. BRAXTON	C. FRANKLIN	D. PICCIRILLO	G. OTTENBERG	A. MASTERS	J. BARTLEY
DATE	12/29/2016	1/3/2017	12/30/2016	12/28/2016	1/12/2017	1/12/2017
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: S:\DRS NEWIENG BRANCH 1\BRANCH INSPECTION FILES\2014-2015-2016 CYCLE INSPECTION FOLDER FOR ALL SITES\SUMMER\2016 MODS_50.59\REPORT\SUMMER 50 59 AND MODS INSPECTION RPT.DOCX

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No.: 50-395

License No.: NPF-12

Report No.: 05000395/2016008

Licensee: South Carolina Electric & Gas (SCE&G) Company

Facility: Virgil C. Summer Nuclear Station, Unit 1

Location: P.O. Box 88
Jenkinsville, SC 29065

Dates: November 14, 2016, through December 9, 2016

Inspectors: G. Ottenberg, Senior Reactor Inspector (Team Leader)
P. Braxton, Construction Resident Inspector
C. Franklin, Reactor Inspector
D. Picirillo, Senior Construction Inspector (Trainee)

Approved by: Jonathan H. Bartley, Chief
Engineering Branch 1
Division of Reactor Safety

Enclosure

SUMMARY

Inspection Report (IR) 05000395/2016008; November 14 – December 9, 2016; Virgil C. Summer Nuclear Station, Unit 1; NRC Evaluations of Changes, Tests, and Experiments and Permanent Plant Modifications.

This report covers a two-week onsite inspection by two regional reactor inspectors, one resident inspector, and one regional construction inspector. No findings were identified. The Nuclear Regulatory Commission's (NRC's) program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

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 inspectors reviewed seven 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 inspectors also reviewed 14 screenings or applicability determinations where licensee personnel had determined that a 10 CFR 50.59 evaluation was not necessary. The samples reviewed are listed in the Attachment. The inspectors 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 inspectors 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 seven evaluation samples and 14 screening and/or applicability determination samples as defined in Inspection Procedure (IP) 71111.17-04.

Permanent Plant Modifications: The inspectors reviewed seven permanent plant modifications that had been installed during the last three years. The modifications reviewed are listed below:

- Commercial Grade Dedication- Purchase Order NU-02SR753804, Wyatt Seal Inc., Viton O-ring
- Commercial Grade Dedication- Purchase Order NU-02SR760205, Shealy Electrical Wholesalers, Fuse
- ECR 50799, Reactor Coolant Pump (RCP) Seal Replacement
- ECR 50893, Engineered Safety Features (ESF) Motor Operated Valves Interlock Logic Change
- ECR 50899, Service Water Traveling Screen Operation after an ESF Signal

- ECR 71587, Setpoint change for instrument number IFB-7273A/B, IFT-7273A/B, IFM-7138, IFM-7158, and IFM-7178 associated with RCPs thermal barrier
- ETBT-72027, Replacement of Gould ITE 222A1175 Relay with ABB 422B1275 Relay

The modifications were selected based upon risk significance, safety significance, and complexity. The inspectors reviewed the modifications selected to determine if:

- the supporting design and licensing basis documentation was updated;
- the changes were in accordance with the specified design requirements;
- the procedures and training plans affected by the modification had been adequately updated;
- the test documentation as required by the applicable test programs had been updated; and
- post-modification testing adequately verified system operability and/or functionality

The inspectors also used applicable industry standards to evaluate acceptability of the modifications and performed walkdowns of accessible portions of the modifications. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On December 9, 2016, the inspectors presented inspection results to Mr. G. Lippard and other members of the licensee's staff. The inspectors verified no proprietary information was retained or documented in this report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

B. Bennett, Licensing Engineer
G. Lippard, Vice President, Nuclear Operations
W. Martin, Licensing Engineer
M. Moore, Supervisor, Licensing
S. Shealy, Supervisor, Design Engineering
B. Thompson, Manager, Licensing

NRC personnel

A. Masters, Chief, Projects Branch 5, Division of Reactor Projects
S. Ninh, Senior Project Engineer, Division of Reactor Projects
J. Reece, Senior Resident Inspector, Division of Reactor Projects

LIST OF REPORT ITEMS

Opened, Closed, and Discussed

None

LIST OF DOCUMENTS REVIEWED

Permanent Plant Modifications

CGD PO NU-02SR753804, Wyatt Seal Inc., O-ring, 1.549X.103, 2-129, Viton, Chromasure, CLR-BRN, Parker Seals, #2-129V884-75, Atwood-Morrill Part #C-3861-A, dated 5/8/14
CGD PO NU-02SR760205, Shealy Electrical Wholesalers, Fuse, 10AX250V/125VDC, Dual Elem, Time Delay, Mersen P/N #TR10R, dated 11/3/15
ECR 50799, Reactor Coolant Pump Seal Replacement, dated 2/18/15
ECR 50893, ESF MOVs Interlock Logic Change, dated 10/14/15
ECR 50899, Service Water Traveling Screen Operation after an ESF Signal, dated 10/15/15
ECR 71587, Setpoint change for instrument number IFB-7273A/B, IFT-7273A/B, IFM-7138, IFM-7158, and IFM-7178 associated with RCPs thermal barrier, dated 8/19/15
ETBT-72027, Replacement of Gould ITE 222A1175 Relay with ABB 422B1275 Relay, dated 6/22/15

10 CFR 50.59 Evaluations

2012-002, ECR 50777, On-Line Breaching of Existing Fire/Pressure Penetration Barriers at Power ECB-1002, Rev. 0
2013-005, ECR 71781, RMA2 Guidance, Rev.0
2014-0001, CR-11-2428, Modify portions of FSAR 4.2.1 to incorporate changes to cladding stress/strain methodology, Rev. 0
2014-0002, CR (NCN)-14-01131, Niobium rich inclusions in Top Nozzle Holddown Springs, Rev. 0
2014-0003, ECR-50846D, Weld Repair Contingency for RV Head Inspections (RF-21), Rev. 0
2015-0001, ECR 50567S, XVB3107A/B Closing Time Watchdog Permissive, Rev. 0
2015-0002, EIR-82139, Chilled Water (VU) train functionality with functional swing chiller racked in, but in pull to lock, Rev. 0

10 CFR 50.59 Screenings/ Applicability Determinations

ARP-001-XCP-633, Annunciator Response Procedure ARP-001-XCP-633 Main Control Board, Rev. 0
CR #15-01658, Special Order # 15-05, Rev. 0, "Accumulators OATC (Mode 1-4) Tech Spec Rounds", Rev. 0
CR (NC) -14-01912, Repair PAB-5403 Penetration Seal, Rev. 0
ECR 50790B, Upgrade Fuel Handling Building for Used Fuel Storage, Rev. 0
ECR 50810, Hazards Protection for NFPA 805 Transition- Electrical Scope Only, Rev. 0
ECR 50855B, Replacement of Fairfield Breakers 8942 and 8912, Rev. 1
ECR 50879, SF Purification Loop Modification, Rev. 0
ECR 51012, FLEX Alternate EFW Suction Source Diesel Generator Building, Rev. 0
ECR 71710, Replacement of Nuclear Measurements Corp. Meter, Beede Designer Model M4-05, Rev. 0
ECR 71731, Revision to DC08200-001 - ESF Undervoltage Logic and Settings, Rev. 0
ECR 71922, Class 1E 480V MCC Thermal Overload Relay Replacement Kits, Rev. 0
STP-110-001, Pre-Core Alterations Verifications, Rev. 0
STP-136-001, Steam Generator Blowdown Valve Operability Test, Rev. 0
STP-601-005, Chemistry Requirements for Multi-Purpose Canister (MPC) Sampling, Rev. 0

Calculations

DC00040-088, App. R Time Critical Actions, Rev. 3
DC01520-065, Design, Review, and Capability of Rising Stem MOVs in the CC, EF, MS, RC, SP, and SW Systems, Revs. 14 and 15

DC04000-015, V.C. Summer Reactor Vessel Head Penetration Thermal Sleeve Repair Weld Evaluation, Rev. 2
 DC04000-017, Reactor Closure Head CRDM Housing Cap Attachment Weld and Torque, Rev. 2
 DC04000-102, Fuel Handling Accident – AST, Rev. 5
 DC04330-081, SW Traveling Screen Maximum Debris Blockage, Rev. 0
 DC04370-016, RCP #1 Seal Backpressure Due to VCT/Seal Elevation Differential, Rev. 1
 DC04370-023, RCP Seal Bypass Line Flow, Rev. 1
 DC04370-028, RCP A/B/C Controlled Seal Bleed-off (CBO) to the VCT Low/High Flow Orifices, Rev. 0
 DC08360-006, Diesel Generator 1A and 1B Load Study, Rev. 11
 DC08620-310, RCS Drain Times Due to RCP Seal Leakage, Rev. 1
 DC08620-311, RB P&T with 546 GPM Seal LOCA, Rev. 1
 DC09610-066, RCP Seal Leakoff (CBO) High Range Flow, Rev. 1
 DC09610-067, RCP Seal Leakoff (CBO) Low Range, Rev. 1
 DC09630-039, RCP-A/B/C 2nd Stage Seal Water Pressure, Rev. 0
 DC09630-040, RCP-A/B/C 3rd Stage Seal Water Pressure, Rev. 0
 DC09640-042, RCP Seal CBO Temperature, Rev. 0
 SW008, SW008 Piping Analysis, Rev. 5.5
 SW011, SW011 Piping Analysis, Revs. 3.3 and 3.6
 WCAP-15987-P, Technical Basis for the Embedded Flaw Process for Repair of Reactor Vessel Head Penetrations, Rev. 2

Procedures

ARP-001-XCP-604, Annunciator Response Procedure, Rev. 7
 ARP-001-XCP-605, Annunciator Response Procedure, Rev. 7
 CMP-600.003, Installation and Repair of High Density Shielding Matrix, Rev. 8, dated 3/11/2015
 EOP 6.0, ECA-0.0, Loss of All ESF AC Power, Rev. 34
 EOP-1.0, E-0, Reactor Trip or Safety Injection, Rev. 29
 EOP-6.1, ECA-0.1, Loss of All ESF AC Power Recovery Without SI Required, Rev. 18
 EOP-6.2, ECA-0.2, Loss of All ESF AC Power Recovery With SI Required, Rev. 16
 ES-0410, Document Only Change Control, Rev. 13
 ES-0419, Equal to/Better Than (ETBT) Evaluation Process, Rev. 10
 ES-0445, Setpoint Development Control, Rev. 3
 ES-321, Procurement of Material and Services, Rev. 11, dated 3/6/2015
 ES-361, Receiving Inspection, Rev. 12, dated 2/24/2016
 ES-365, Nondestructive Testing of Non-metallic Materials Using the REX Durometers Models 1700 A&D and Model 1600, Type 00, Rev. 6, dated 11/14/2015
 ES-513, MOV Program Implementation, Rev. 2
 FPP-025, Fire Containment, Revs. 4 and 6
 IC-02, VCSNS Setpoint Program Methodology Guideline, Rev. 0
 MRS-SSP-2913, RVHR Thermocouple/Spare/CRDM Penetration Repair at V.C. Summer Unit 1, Rev. 1
 MRS-SSP-2914, Penetration Thermal Sleeve Removal and Installation at V.C. Summer Unit 1, Rev. 1
 MTP-50799.001, Reactor Coolant Pump Seal Replacement Test Plan, Rev. 0
 MTP-51012.001, Flex Alternate EFW Suction Source Testing, Rev. 0, dated 7/19/2016
 OAP-100.4, Communication, Rev. 3
 PR-02, Identification of Critical Characteristics, Rev. 3
 PR-03, CGI Acceptance Methodology, Rev. 6

QSP-204, Quality Control Inspection, Rev. 13, dated 8/27/2014
 SAP-0107, 10 CFR 50.59 and 10 CFR 72.48 Review Process, Rev.6
 SAP-0125, Setpoint Program, Rev. 0
 SAP-0133, Design Control/Implementation and Interface, Rev. 15
 SAP-0363, Foreign Material and Debris Control, Rev. 8, dated 8/24/2010
 SAP-0643, ASME Code, Section XI Repair/Replacement Program, Rev. 8, dated 3/11/14
 SAP-1163, Control of Documents required for Licensing, Rev. 6
 SAP-160, Motor Operated Valve Program, Rev. 1
 SAP-400, Chemistry Operations Manual, Rev. 13, dated 5/23/2012
 SOP-117, Service Water System, Rev. 24
 WM-1.0, Welding Manual Procedure, Rev. 16, dated 10/24/2016

Drawings

B-208-002, Sheet 1, Electrical Elementary Diagram Notes, Legend & Relay Internals, Rev. 6
 B-208-021, Sheet 19, Electrical- Elementary Diagram RCS Charging Line Valve (XVG8107), Rev. 11
 B-208-097, Sheet 11, Electrical- Elementary Diagram Reactor BLDG Sump Isolation Valve 'A' XVG3005A Rev. 14
 D-101-011, Auxiliary Building Floor Plan Elevations 374 and 385, Rev. 18
 D-101-023, Auxiliary Building Penetration Access Floor Plan, Rev. 12
 D-302-221, Sheet 1, Service Water Cooling, Rev. 31
 D-302-221, Sheet 2, Service Water Cooling, Rev. 3
 D-302-222, Sheet 1, Service Water Cooling A- Train Outside RB, Rev. 8
 D-302-222, Sheet 2, Service Water Cooling A- Train Cooling to RBCU Loop, Rev. 3
 D-302-222, Sheet 3, Service Water Cooling B- Train Outside RB, Rev. 4
 D-302-222, Sheet 4, Service Water Cooling B- Train Cooling to RBCU Loop, Rev. 3
 D-400-261, Concrete Details Standards, Rev. 19
 E-001-013, Turbine Building Basement Floor Plan Above Elevation 412'-0," Rev. 40
 E-001-023, Turbine Building Mezzanine Floor Plan Above Elevation 438'-0," Rev. 39
 E-001-061, Building Arrangement Drawing, Rev. 23
 E-002-002, Auxiliary & Reactor Building Section B-B Looking North, Rev. 19
 E-005-003, Misc. Section Thru Control Building, Rev. 11
 E-512-111, Auxiliary Building Miscellaneous Steel Embedded Details, Rev. 6
 VCS IFT07138-CC, Component Cooling Water from RC Pump A Thermal Barrier Flow, Rev. 3
 VCS IFT07158-CC, Component Cooling Water from RC Pump B Thermal Barrier Flow, Rev. 3
 VCS IFT07178-CC, Component Cooling Water from RC Pump C Thermal Barrier Flow, Rev. 3
 VCS IFT07263A-CC, Instrument Loop Diagram – RC Pump A, B, C, Upper and Lower Bearing Flow, Rev. 1
 VCS-IFT072738-CC, Instrument Loop Diagram – RC Pump A,B, C Thermal Barrier Flow, Rev. 1

Miscellaneous Documents

1MS-948-0496, Reactor Coolant Pump Model W-11015-A1 (93A), Rev. 11
 CGGS-36336, Analysis of Valves for Operator Stall, dated 8/27/87
 CGSG-8708, Equipment Required for Safe Shutdown, dated 1/9/1980
 DBD-CC, Component Cooling Water, Rev. 13
 DBD-MV2, Motor Operated Valve Design Review, Capability, and Setup Volume 2, Rev. 6
 DBD-RC, Reactor Cooling System, Rev. 9, dated 8/8/2016
 DBD-RI, Reactor Internals Design Basis Document, Rev. 1, dated 12/28/2015
 DBD-SB, Setpoint Bases, Rev. 1
 ECN-1421, Change of Classification of Service Water Screen from Active to Passive, dated 2/4/1980

ECR 50592, EHC Digital Upgrade, Rev. 5
 ECR 51003B, Flex Alternate EFW Suction Source, Rev. 5
 ECR 71072, Alternate Source Term, Rev. 13
 ECR 71888, Cycle 22 Reload Core Design, Rev. 6
 IB-1, Service Water System, Rev. 25
 Report for 2016 Annual FERC required SW Pond Dams Area Inspection, dated 10/03/2016
 Special Order 15-05, OAP-106.1, ECCS Accumulator Levels, Rev. 0, dated 4/24/15
 Special Order 15-07, 'A/B' HVAC Chiller/Train (VU), Rev. 1, dated 4/8/16
 SRO Attendance Sheet, Technical Specifications 3.4.6.1 RCS Leakage Detection Systems,
 dated April 2012

Corrective Action Documents

02-01005	02-03116
05-00500	99-00180
11-00093	11-00955

Work Orders

1310296	1308677
1409772	1409773
1504590	1504591
1504593	1504594
1504595	1504596
1504597	1504598
1504600	1505182
1508095	

Condition Reports generated as a result of the inspection

CR-16-05762, During the 2016 NRC 50.59/ Modifications Inspection, the NRC inspector questioned the ECR number referenced in the 10CFR50.59 evaluation documentation for ECR 71781.
 CR-16-06002, The NRC 50.59 Plant Mods Inspection Team found a discrepancy during review of the 50.59 screen for Special Order 15-05, Rev. 0, "Accumulators OATC (Mode 1-4) Tech Spec Rounds."
 CR-16-06003, The NRC 50.59 Plant Mods Inspection Team raised a question regarding the FSAR updates for Main Steam Line Breaks Outside of Containment.
 CR-16-06111, NRC identified during NRC 50.59 Inspection evaluation of ECR-50893
 CR-16-06152, Trending CR: During the 2016 NRC 50.59/ Modifications Inspection, the NRC inspector questioned the apparent timeliness in implementing revision of AOP-301.1, Attachment 3, "Response to Electrical Grid Issues" per markups from ECR-71731, "Revision to Design Calculation DC08200-001" (ESF Undervoltage Logic and Settings).
 CR-16-06169, While in the 2016 50.59 inspection, during the review of CR-14-01912 (and Work Order 1301099 step 24) the NRC identified a discrepancy in the work order documentation.
 CR-16-06194, In review of ECR-50585, the NRC 50.59 Plant Mods inspection team questioned instructions provided for post modification testing for the floor drain system after the installation of the HELB orifices.
 CR-16-06196, The NRC 50.59 Plant Mods Inspector team questioned how Special Orders (SO) are managed regarding the criteria for retiring an SO.