



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

October 30, 2015

Mr. David A. Heacock  
President and Chief Nuclear Officer  
Virginia Electric & Power Company  
Innsbrook Technical Center  
5000 Dominion Blvd.  
Glen Allen, VA 23060-6711

SUBJECT: SURRY POWER STATION – U.S. NUCLEAR REGULATORY COMMISSION  
EVALUATION OF CHANGES, TESTS, AND EXPERIMENTS AND PERMANENT  
PLANT MODIFICATIONS INSPECTION REPORT 05000280/2015007 AND  
05000281/2015007

Dear Mr. Heacock:

On October 1, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Surry Power Station, Units 1 and 2, and discussed the results of this inspection with Mr. R. Simmons and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report (IR).

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* (10 CFR) 2.390, "Public inspections, exemptions, requests for withholding" of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter, and its Enclosure, will be available electronically for public inspection in the NRC Public Document Room, or from the Publicly Available Records (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS); accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

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

Docket Nos. 50-280 and 50-281  
License Nos. DPR-32 and DPR-37

Enclosure:  
NRC IR 05000280 and 281/2015007  
w/Attachment: Supplementary Information

cc: Distribution via Listserv

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SIGNATURE	RNP1	MSC2 via e-mail	JAG3 via e-mail	NJH via e-mail	JHB1	KME	
NAME	R. Patterson	M. Coursey	J. Gilliam	N. Hansing	J. Bartley	K. Ellis	
DATE	10/ 29 /2015	10/ 29 /2015	10/ 29 /2015	10/ 29 /2015	10/ 30 /2015	10/ 30 /2015	
E-MAIL COPY	YES    NO	YES    NO	YES    NO	YES    NO	YES    NO	YES    NO	

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Letter David Heacock from Jonathan Bartley dated October 30, 2015

SUBJECT: SURRY POWER STATION – U.S. NUCLEAR REGULATORY COMMISSION  
EVALUATION OF CHANGES, TESTS, AND EXPERIMENTS AND PERMANENT  
PLANT MODIFICATIONS INSPECTION REPORT 05000280/2015007 AND  
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**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos: 50-280 and 50-281

License Nos: DPR-32 and DPR-37

Report Nos: 05000280/2015007 and 05000281/2015007

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: Surry Power Station, Units 1 and 2

Location: 5850 Hog Island Road  
Surry, VA 23883

Dates: September 14, 2015, through October 1, 2015

Inspectors: Robert N. Patterson, Acting Senior Reactor Inspector (Team Leader)  
Michael S. Coursey, Reactor Inspector  
Jasmine A. Gilliam, Reactor Inspector  
Nicholas J. Hansing, Technical Reviewer, HQ

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

Enclosure

## **SUMMARY**

Inspection Report (IR) 05000280/2015007 and 05000281/2015007; 9/14/2015 – 10/1/2015; Surry Power Station, Units 1 and 2; Evaluations of Changes, Tests, and Experiments and Permanent Plant Modifications

This report covers a 2-week onsite inspection by one senior reactor inspector, two reactor inspectors, and one technical reviewer. No findings or violations 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 5.

## 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 of the *Code of Federal Regulations* (10 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 16 screenings 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
- 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," Rev. 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.

Permanent Plant Modifications: The team reviewed six permanent plant modifications that had been installed in the plant during the last 3 years. The modifications reviewed are listed below:

- DCP 06-045, Replace SW Carbon Steel Piping With Copper-Nickel Pipe Class or Coated Piping/Surry/ Unit 1
- DC SU-12-00012, Replace EDG Governor Booster Pump Suction Line Units 1 & 2
- DC SU-10-01041, High Head Safety Injection MOV Valve Pressure Locking Modifications/S/1&2
- DC SU-11-01108, Set Point Change For Emergency Service Water Temperature Switches
- DC SU-11-00015, Reactor Coolant Pump (RCP) Seal Replacement (2-RC-P-1B) /S/2
- DC SU-11-01049, Loop Stop MOV Stem Connection MOD/S/1&2

The modifications were selected based upon risk significance, safety significance, and complexity. The team 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
- post-modification testing adequately verified system operability and/or functionality

The team 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 October 1, 2015, the team presented inspection results to Mr. Simmons 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: SUPPLEMENTARY INFORMATION

## **SUPPLEMENTARY INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee personnel:

R. Simmons, Plant Manager  
D. Lawrence, Director of Nuclear Safety and Licensing  
J. Rosenberger, Director of Nuclear Engineering  
B. Garber, Licensing Supervisor  
J. Pollard, Engineer III, Licensing  
N. Dodenhoff, Electrical Design Supervisor  
B. Day, Design Manager  
R. Scanlan, Maintenance Manager

#### NRC personnel:

S. Rose, Chief, Projects Branch 5, Division of Reactor Projects  
P. McKenna, Senior Resident Inspector, Division of Reactor Projects  
C. Jones, Resident Inspector, Division of Reactor Projects

### **LIST OF DOCUMENTS REVIEWED**

#### Licensing Documents

TS, Current  
TRM, Current  
UFSAR, Current  
SER and Supplements

#### 10 CFR 50.59 Evaluations

DCP 08-021, Turbine Retrofit  
DC SU-11-00017, CCHX SW Inlet Pipe Repair & 1-SW-MOV-102 A & B Replacement/S/1  
DC SU-13-00012, CCHX Service Water Outlet Jumper  
ETE-NAF-2013-0087, Updated Rx Vessel Lower Radial Key Stiffness  
ETE-SU-2015-0006, RV Support Sliding Foot Assembly Cap Screws Evaluation for Elimination  
0D000496, Hi-Hi CLS Relay 01-CLS-RLY-2BM

#### 10 CFR 50.59 Screenings

DC SU-08-0013, Auxiliary Feedwater Cross-Tie MOV Valve and Actuator Modification  
DC SU-12-01194, Hi CLS Relay Jumper Installation (2-CLS-RLY-1B9)/Surry/Unit 2  
DC SU-11-00013, Vent Valve for LHSI Pump Suction Piping  
DC SU-13-01201, EDG Exhaust Expansion Joint Replacement  
DC SU-12-01201, Hi CLS Relay Jumper Installation (1-CLS-RLY-1B9) Surry Unit 1  
DC SU-14-01016, U2 "B" SI Accumulator Discharge MOV Modification/S/2  
DC SU-13-00013, Unit 2 FAC Modifications/SPS/2014  
DC SU-12-01108, Replacement Valve Positioners for 1/2-SW-TCV-108 & 208/S/1&2  
DCP 07-015, NRC GSI-191 Piping Insulation Mods/Surry/Unit 1  
DC SU-14-01126, RFO Unit 1 FAC Replacement  
DC SU-14-01153, U1 "C" SI Accumulator Discharge MOV Modification/S/1  
DC SU-92-013, CHARGING PUMP SW TCV CONTROLLER REPLACEMENT (1/2-SW-TC-108-208A-C) SURRY UNITS 1 & 2



DC SU-11-00015, Reactor Coolant Pump (RCP) Seal Replacement (2-RC-P-1B) /S/2  
 DCP 02-068, Polar Crane Uprate/S/1  
 DCP 08-017, Elimination of the SPV for the CC Trip Valves/S/1&2  
 DCP 07-038, Replacement Of Valve Positioners 1-SW-PCV-100D/E & 1-SW PCV-101 D/E for  
 Chillers 1-VS-E-4D/E/S/1&2

#### Calculations

ME-0930, Surry Units 1 & 2, EDG Maximum Ambient Air Temperature Operability Limit, Rev. 0  
 ME-0597, Minimum Delivered AFW Flow and Acceptance Criteria for AFW Pump Operability  
 Verification Testing, Rev. 4  
 SM-1118, Impact of Component Cooling Service Water Inlet Pipe Repair on Unit 2 Core  
 Damage Frequency, Rev. 0  
 ET CCE 00-0008, Compensatory Measures for Heavy Loads on 01-CR-CRN-2A & 2B, Rev. 1

#### Corrective Action Documents

490992	483763	282008
491052	534646	282009
491378	118749	532703
493214	274698	546069
483778	281754	272041

#### Procedures

CM-AA-DDC-201, Design Changes, Rev. 16  
 CM-AA-400, 10 CFR 50.59 and 10 CFR 72.48 – Changes, Tests, and Experiments, Rev. 4  
 MS-AA-IEE-301-1001, Item Equivalency Evaluation Screening Checklist Aid, Rev. 0  
 CM-AA-SAR-101, Updating Safety Analysis Report (SAR), Rev. 5  
 2-IPM-SW-TCV-208C, Charging Pump Lube Oil Temperature Control Valve 2-SW-TCV-208C  
 Calibration, Rev. 7  
 0-ICM-AOV-001, Diagnostic Testing on Air Operated Valves, Rev. 14  
 2-AP-16.01, Shutdown LOCA, Rev. 21  
 2C-E4, RCP 1B Seal Leakoff Lo Flow, Rev. 2  
 2-ECA-1.1, Loss of Emergency Coolant Recirculation, Rev. 40  
 2-FR-C.1, Response to Inadequate Core Cooling, Rev. 35  
 2-MOP-RC-003, Removal of 2-RC-P-1B for Maintenance, Rev. 9  
 2-PT-36-R, Instrument Surveillance, Rev. 18  
 2-PT-36-LOG1R, Unit 2 Operations Normal Log #1, Rev. 110 and 11  
 0-ECM-1509-06, Quiklook Testing for Quarter Turn Motor Operated Valves, Rev. 21 and 22  
 2-DRP-007, Motor Operated Valve Operating Bands, Rev. 32, 33, and 34  
 O-MOP-SW-002, Operation of Unit 1 to Unit 2 Service Water Jumper, Rev. OTO4  
 CM-AA-400, 10 CFR 50.59 and 10 CFR 72.48- Changes, Tests, and Experiments, Rev. 4  
 1-SWI-CLS-RLY-2BM, SWI for Manual Reset of Latching Relay 1-CLS-RLY-2BM, Rev. 1  
 1-E-1, Loss of reactor or Secondary Coolant, Rev. 43  
 1A-C6, ACCUM TK 1C OUT VV CLOSED, Rev. 2  
 1-FSG-10, SI Accumulator Isolation, Rev. 0  
 2-OPT-EG-001, Number 2 Emergency Diesel Generator Monthly Start Exercise Test, Rev. 74  
 2-OP-EG-001, Number 2 Emergency Diesel Generator, Rev. 56  
 2-OPT-EG-010, Number 3 EDG Overspeed Trip Test, Rev. 23  
 0-OP-SW-002, Emergency Service Water Pump Operation, Rev. 45  
 0-OPT-SW-001, Emergency Service Water Pump 1-SW-P-1A, Rev. 60  
 ER-AA-NDE-VT-603, Non-Destructive Examinations, Rev. 4

Completed Procedures:

70275415, RM-AA-101 SIMCO Electronics Vendor Evaluation, 7/10/2014

Drawings

S-06045-0-2FM071A, Flow/Valve Operating Numbers Diagram Circulating and Service Water System Surry Power Station Unit 2 Virginia Power, Sheet 3 of 3, Rev. 0  
 S-06045-0-1FM071A, Flow/Valve Operating Numbers Diagram Circulating and Service Water System Surry Power Station Unit 1 Virginia Power, Sheet 2 of 4, Rev. 0  
 S-06045-0-2MKSWS2, Service Water System Surry Power Station - Unit 2, Sheet 1 of 1, Rev. 0  
 S-06045-0-2MKS2021A25, Service Water System Surry Power Station - Unit 2, Sheet 1 of 1, Rev. 0  
 S-06045-0-1MKS1021A3, Service Water System Surry Power Station - Unit 1, Sheet 1 of 1, Rev. 0  
 S-06045-0-M-400, Reinstallation Service Water Piping Surry Power Station - Unit 1, Sheet 1 of 1, Rev. 1  
 S-06045-0-M-401, Reinstallation Service Water Piping Surry Power Station - Unit 2, Sheet 1 of 1, Rev. 0  
 11448-CBM-071A-5, ISI Classification Boundary DWG Interval-5 Circulating and Service Water System Surry Power Station Unit 1 Virginia Power, Sheet 1 of 4, Rev. 0  
 1300012-11448-FM-071A, Flow/ Valve Operating Numbers Diagram Circulating and Service Water System, Rev. 01300012-1-M-4200, Pipe Support Locations and Piping Details Temporary SW Piping Jumper, Rev. 0  
 1300012-1-M-800, Isometric – Temporary SW Piping Jumper, Rev. 0  
 1201201-11448-ESK-7J1, Elementary Diagram Consequence Limiting Safeguards, Rev. 0  
 11548-FM-068A, Flow/Valve Operating Numbers Diagram, Feedwater System, Surry Power Station Unit 2, Virginia Power, Rev. 59, Sheet 3 of 4  
 11448-FM-068A Flow/Valve Operating Numbers Diagram, Feedwater System, Surry Power Station Unit 1, Virginia Power, Rev. 53 Sheet 3 of 4  
 11548-FK-1E, Instrument Air Piping, Reactor Containment, Surry Station – Unit 2, Rev. 12  
 11548-FM-086B, Flow/Valve Operating Numbers Diagram, Reactor Coolant System, Surry Power Station Unit 2, Virginia Power, Rev. 28 Sheet 3 of 3  
 Dominion Drawing 11715/12050-6.31-62D SH-001 (Crane No. K-6682), “600LB. Cast Steel Gate Valve – 6” to 12” Welding Ends – Rising Stem General Assembly & Dimensions  
 11448-ESK-11L, ESW Pump Elementary Drawing, Rev. 17  
 11448-FE-18CA, DC Start System, Diesel Control Panel, Rev. 9  
 11448-FM-087A, Flow/Valve Operating Diagram for RHR System, Rev. 23  
 11448-FM-087A, Flow/Valve Operating Diagram for RHR System, Rev. 30  
 11448-FM-089A, Flow/Valve Operating Diagram for SI System, Rev. 61  
 11548-FM-089A, Flow/Valve Operating Diagram for SI System, Rev. 40  
 11448-FM-089A, Flow/Valve Operating Diagram for SI System, Rev. 50  
 11548-FM-089A, Flow/Valve Operating Diagram for SI System, Rev. 52  
 11548-FM-089A, Flow/Valve Operating Diagram for SI System, Rev. 53  
 11448-FM-089A, Flow/Valve Operating Diagram for SI System, Rev. 56

Miscellaneous Documents

ME-0017, Motor Operated, Ball Valves for SPS, Rev. 0  
 Stone and Webster Engineering Corporation (SWEC) Specification NAS-0163B, Rev. 2,  
 ME-0009, Design Specification for Reactor Coolant Pump N-9000 Seal Assembly, Rev.1  
 Screenshot of AOV Program database (MAXIMO)

RDR-0171, Design Report Type N-9000 Replacement Reactor Coolant Pump Seal  
 Southwest Research Institute Project No. 18.18049.01.104 "Mechanical Properties of 1<sup>st</sup> and 3<sup>rd</sup>  
 Stage In-service Elastomer Seals from a Reactor Coolant Pump in Arkansas Nuclear One"  
 Southwest Research Institute Project No. 18.1806150 "Mechanical Properties of 1<sup>st</sup> and 3<sup>rd</sup>  
 Stage In-service Irradiated O-rings from a Reactor Coolant Pump Seal"  
 DNES-VA-GN-0030, Nuclear Plant Set points, Rev. 0  
 WCAP-16175-P-A, Model for Failure of RCP Seals Given Loss of Seal Cooling in CE NSSS  
 Plants, Rev. 0  
 WCAP-15603, WOG 2000 Reactor Coolant Pump Seal Leakage Model for Westinghouse  
 PWRs, Rev. 1-A  
 Station Blackout Test on a Reactor Coolant Pump Mechanical Seal  
 300001306 Western Branch Diesel Inc. Inspection Results  
 Detroit Diesel Heat Exchanger Vendor Manual  
 NOTEBK-PRA-SPS-RA.037, PRS Input into CCHX SW Outlet Jumper DC, Rev. 1  
 NSAL-11-2, Impact of Change in Lower radial Key Stiffness Value, dated June 28, 2011  
 9087-ES-1, Emergency Diesel Generator High Temperature Operations and Instrument  
 Setpoints, Rev. 1  
 ET-CME-03-0024, Design Input for Actuator Motor and Gear Ratio Change, 01-SI-MOV-  
 1865A/B/C and 02-SI-MOV-2865A/B/C, Rev. 0  
 ET CCE 00-0008, Compensatory Measures for Heavy Loads on 01-CR-CRN- 2A &2B, Rev. 1

Work Orders

38102431954	38102917652	38102600640
38103335258	38102567903	38102600620
38102757885	38102389448	201202061020
38102757274	38102692305	201103161130
38102755002	38103095850	200907071030
38102757237	38103107366	

Corrective Action Program Documents generated as a result of the inspection

1011568, Discrepancies in DC SU-11-00015 for the 1-RC-P-1B Seal Replacement  
 1010710, DC SU-11-00015 Did Not Identify Calculation EE- 0106, Loop Uncertainty Calculation  
 for RCP Seal DP Indication  
 1005486, Apparent Cause to Perform 50.59 Evaluation for the N9000 Seal Design Changes