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

August 6, 2012

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

SUBJECT: SURRY POWER STATION UNITS 1 AND 2 – NRC POST-APPROVAL SITE INSPECTION FOR LICENSE RENEWAL, FOLLOWUP INSPECTION REPORT 05000280/2012010 AND 05000281/2012010

Dear Mr. Heacock:

On June 22, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed a Post-Approval Site Inspection for License Renewal at your Surry Power Station. This inspection had the objective to follow-up eight observations associated with the implementation of Aging Management Programs for the period of extended operation, which were originally documented in NRC Inspection Report 05000280/2011010 and 05000281/2011010. The enclosed report documents the inspection results, which were discussed on June 22, 2012, with members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

On the basis of the sample selected for review, no findings were identified. The inspectors concluded that all the necessary actions to meet the selected license renewal commitments were completed. The enclosed report also documents a performance deficiency of minor significance involving a violation of regulatory requirements that is not subject to enforcement action in accordance with the NRC's Enforcement Policy. This inspection completes the series of planned post-approval license renewal inspections at Surry Power Station in accordance with NRC inspection procedure IP 710003, "Post-Approval Site Inspection for License Renewal."

In accordance with 10 CFR 2.390 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 (PARS) component of

NRC's document 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 by Joel Rivera-Ortiz Acting For/

Steven J. Vias, Chief
Engineering Branch 3
Division of Reactor Safety

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

Enclosures:
NRC Inspection Report 05000280/2012010 and 05000281/2012010
w/Attachment: Supplemental Information

cc w/encls: (See Page 3)

D. Heacock

NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

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DATE	8/ 7 /2012	8/ 7 /2012	8/ 6 /2012				
E-MAIL COPY	**YES** NO	**YES** NO	**YES** NO				

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cc w/encls:

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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 No:	05000280/2012010 and 05000281/2012010
Licensee:	Virginia Electrical and Power Company (VEPCO)
Facility:	Surry Power Station
Location:	Surry, Virginia 23883
Dates:	June 18 – 22, 2012
Inspectors:	Louis Lake, Senior Reactor Inspector
Approved by:	Steven J. Vias, Branch Chief Engineering Branch 3 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

Inspection Report 05000280/2012010 and 05000281/2012010; June 18 – 22, 2012; Surry Power Station; Post-Approval Site Inspection for License Renewal (Phase 3).

The report covers a follow-up inspection conducted by regional inspectors in accordance with Nuclear Regulatory Commission (NRC) Manual Chapter 2515 and NRC Inspection Procedure 71003, "Post-Approval Site Inspection for License Renewal."

Based on the sample selected for review during this inspection, the inspection results presented in NRC Inspection Reports 05000280/2011010, 05000281/2011010, and 05000280/2012009, the inspectors determined that the licensee completed the necessary actions to meet the license renewal commitments, license conditions, and regulatory requirements selected for review. This report also documents a performance deficiency of minor significance involving a violation of regulatory requirements that is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

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

4. OTHER ACTIVITIES

4OA5 Other Activities

.1 Post-Approval Site Inspection for License Renewal – IP 71003 (Phase 3)

a. Inspection Scope

The inspectors conducted a follow-up of eight observations identified in a Surry Unit 1 and Unit 2 license renewal inspection conducted in July 2011 in accordance with NRC Inspection Procedure 71003, "Post-Approval Site Inspection for License Renewal." The results of that inspection were presented in NRC Inspection Report 05000280/2011010 and 05000281/2011010 (hereinafter referred to as NRC Inspection Report 2011010). The report identified eight observations that were subject to a follow-up inspection in accordance with NRC inspection procedure IP 71003, in order to obtain reasonable assurance that license renewal commitments were met.

Additionally, the NRC conducted a follow-up inspection of the status of corrective actions for four of the eight observations; specifically for Commitment Items 9, 14, 19, and 27; during a Phase 1 license renewal inspection performed at Surry Unit 1 in May 2012. The results of that inspection were presented in NRC Inspection Report 05000280/2012009 (hereinafter referred to as NRC Inspection Report 2012009).

This inspection had the main objective of completing the review of licensee actions to address the eight observations documented in NRC Inspection Report 2011010. The inspectors interviewed plant personnel, reviewed program and implementing procedures, and corrective action documents to verify that for the eight NRC-identified observations; the licensee completed the necessary actions to: (a) comply with the conditions stipulated in the renewed facility operating license; (b) meet the license renewal commitments described in NUREG-1766, "Safety Evaluation Report (SER) Related to the License Renewal of Surry Power Station Units 1 and 2;" and (c) meet the future activities, including aging management programs (AMPs), described in the Updated Final Safety Analysis Report (UFSAR) supplement submitted pursuant to 10 CFR 54.21(d). The inspectors also used the inspection results documented in NRC Inspection Report 2012009 as the basis for completing the review of the eight observations.

The specific inspection scope of each observation is discussed below. The observations are presented in the same order they were presented in NRC Inspection Report 2011010.

Observation for Commitment Item 1 – Develop and Implement an Inspection Program for Buried Piping and Valves

This observation identified that for the buried piping program, the licensee had yet to perform the piping excavation and visual examinations of the representative sample category of copper-nickel buried piping as described in the Commitment. Additionally, the inspectors noted that the licensee's UFSAR did not adequately reflect the NRC's SER evaluation in that "…the applicant's program will ensure that a sample of each

component, based on material and environment, will be excavated at least once prior to the period of extended operation…" The inspectors identified that the licensee had no plans to excavate buried copper-nickel piping to perform the inspections described in the Commitment, and therefore would not have met this Commitment. This observation was captured in the licensee's Corrective Action Program under condition reports (CR) 435918 and CR 435920.

During this follow-up inspection, the inspectors interviewed responsible plant personnel and reviewed program documents, implementing procedures for the buried piping program, completed corrective actions identified in the plant Corrective Action Program, and the results of the copper-nickel buried piping visual inspections, to verify that the licensee's actions to address the piping excavation and visual examinations of copper-nickel buried piping, including the UFSAR description, were consistent with the license renewal commitment.

Observation for Commitment Item 19 – Develop and Implement Inspection Program for Non-EQ Cables

This observation identified that the procedure titled "Guidance and Reference Document ER-SU-5909, SPS Program to Inspect Non-EQ Electrical Cables," Rev. 0, which provided instructions for certain license renewal activities, in Step 3.2, directed the licensee to "Perform a review at least annually of routine calibration results (as required by the plant technical specifications) for the source, intermediate and power range neutron detector circuits." Step 3.3 directed the licensee to "Perform a review at least annually of periodic surveillance information to determine exposure of in-scope medium voltage power cable to wetted conditions." The inspectors identified that, although the required routine calibrations of nuclear instrumentation were being performed, the annual review required in Steps 3.2 and 3.3 were not being implemented. The licensee initiated CRs 434832, 435764, and 435945 to address this issue.

There were no inspections conducted for this commitment during this follow-up inspection. This observation was addressed during the Surry Unit 1 license renewal Phase 1 inspection documented in NRC Inspection Report 2012009. The results of that inspection included the review of the licensing basis, revised implementing procedures, and the updated final safety analysis report. The inspection also verified that annual reviews were completed as required by the licensee implementing procedure.

Observation for Commitment Item 27 – Develop and Implement a Program to Control Water Intrusion into Manholes at Surry Power Station

Commitment Item 27 stated that the licensee would develop and implement a program to control water intrusion into manholes at Surry prior to the period of extended operation. This observation identified that the licensee had initiated CR 421104 on 4/6/2011 to identify that the single in scope license renewal Ductline Sump Manhole No. 2 was not being periodically inspected for water collection. That manhole carries the 34.5kV cable that supplies the "C" Reserve Station Service Transformer (RSST) which is needed for a recovery from a station blackout (SBO). The SER stated that such manholes would be visually inspected for water collection at frequencies ranging from bi-weekly to annually. That frequency was derived from licensee letter serial number 02-297 dated July 11, 2002. The proposed solution in the CR was to include this manhole in the program for visual inspection of manholes implemented in procedure

0-MCM-1207-01, “Pumping of Security and Electrical Cable Vaults.” However, the inspectors observed that the procedure contained a precaution saying that personnel entry into the manhole was neither required, nor permitted, during performance of this procedure. The inspectors learned, from licensee interviews and drawing reviews, that the manhole construction is such that nothing can be seen from visual inspection from the top of the manhole because of its depth (30 feet) and its tiered construction. Therefore, procedure 0-MCM-1207-01 would not have provided adequate instructions during the period of extended operation to inspect the manhole in accordance with the Commitment. The licensee needed to take additional actions to either modify procedure 0-MCM-1207-01 or establish a new procedure to conduct periodic visual inspections of Ductline Sump Manhole No. 2. The licensee initiated CR 434167 to enter this observation in the Corrective Action Program.

There were no inspections conducted for this observation during this follow-up inspection. This observation was addressed during the Surry Unit 1 license renewal Phase 1 inspection documented in NRC Inspection Report 2012009. The inspectors reviewed the licensing basis, implementing procedures and engineering evaluations, verified that procedure
0-MCM-1207-01 has been modified, and reviewed the results of visual inspection conducted by visual examination performed at the bottom of the manhole and the location of the 34.5kV cable.

Observation for Commitment Item 9 – Develop and Implement an Inspection Program for Infrequently Accessed Areas

This observation identified that not all of the required inspections under this commitment had been completed at the time of this inspection. Consequently, not all of the inspection evaluations, on which the need for future additional inspections would be based, had been completed. These issues were being monitored through the licensee’s Corrective Action Program as LA000419. The licensee had listed this Commitment Item as open pending the completion of inspections and evaluations for all infrequently accessed areas that fall under this program scope.

This observation was addressed, in part, during the Surry Unit 1 license renewal Phase 1 inspection documented in NRC Inspection Report 2012009. The inspectors conducted the following inspections:

- The inspectors reviewed the licensing basis, program basis documents, implementing procedures and relevant condition reports. The inspectors verified that all of the infrequently accessed areas listed in the licensee’s technical report LR-1768/2768 were included in the newly developed program documents, and that these documents reflected their applicability to the license renewal program. The inspectors also verified that these requirements were adequately translated into the UFSAR. Additionally, the inspectors interviewed the responsible plant personnel regarding this program and its implementation.

- The inspectors conducted a containment walkdown to assess the material condition of the containment metal liner and the general condition of safety related system components located inside the containment. This walkdown was limited to those areas that were accessible during fuel movement and other significant maintenance activities. During this inspection an observation of general corrosion

was identified on the external surfaces of the Component Cooling system piping. This condition had previously been identified and the licensee has developed a component cooling monitoring program that includes periodic visual examinations and ultrasonic thickness checks to maintain the wall thickness of the piping within acceptable values.

- The inspectors also reviewed documentation of previous licensee inspections of the area in the containment known as the Unit 1 Nuclear Instrumentation (NI) Sump Pump room. The documentation included photographs that showed boric acid buildup on piping, electrical conduits, and electrical panels. The documentation also indicated that this boric acid buildup has been accumulating since 2007. This condition was entered into the licensee's Corrective Action Program with corrective actions to remove the boric acid and conduct an evaluation of the boric acid effects prior to plant startup at the end of the Unit 1 spring 2012 refueling outage.

During this follow-up inspection, the inspectors conducted an additional review of the boric acid buildup in the Unit 1 NI Sump Room and reviewed inspection results conducted in infrequently accessed areas to verify that licensee actions were consistent with the license renewal commitment. The inspectors identified an observation associated with the inspection of the Neutron Shield Tank, which is discussed in the Findings section of this report.

Observation for Commitment Item 10 – Develop and Implement Inspection Program for Tanks

This observation identified that evaluations of the one-time tank inspections, that would form the basis for any additional needed inspections, had not been completed. The requirement to complete these evaluations were being tracked in the licensee's Corrective Action Program as LA000420.

The inspectors reviewed the licensee's corrective actions to verify that the licensee performed the evaluations that formed the basis for the annual inspection of tanks within the inspection program for tanks, and confirmed that the results were incorporated into the tank inspection schedule.

Observation for Commitment Item 14 – Follow Industry Activities Related to Reactor Vessel Internals Issues Such as Void Swelling, Thermal, and Neutron Embritlement, etc. Evaluate Industry Recommendations. Inspect Accordingly.

This observation identified that in a response to a Request for Additional Information (RAI) for the license renewal application, the licensee stated that in order to meet the Commitment related to Reactor Vessel Internals, they would perform an evaluation to determine the reactor most susceptible to failure from an environmental fatigue aspect. The licensee also stated that they would subsequently perform a "one-time, focused inspection" on that most susceptible reactor. When the evaluation was completed, the licensee determined that for all but one of the aging mechanisms, Surry Unit 1 was the most susceptible reactor. The lone exception was the Surry Unit 2 Control Rod Guide Tubes (CRGTs), which was determined to be the most susceptible component for one of the aging effects.

The observation also identified that the licensee's plans only included a one-time, focused inspection on the Surry Unit 1 reactor vessel components, and that the licensee understood that performing the same type of inspection on the Surry Unit 2 CRGTs was not necessary to meet the license renewal commitment. Based on discussions with the licensee staff, the inspectors determined that the licensee intended to do the inspections on the Surry Unit 2 CRGTs. However, the inspectors found that this was not formally proceduralized, and therefore insufficient information existed to demonstrate that Commitment Item 14 was met in its entirety. In addition, the evaluation performed by the licensee was documented in Engineering Transmittal (ET) ET-S-10-0067. This document stated that the Surry Unit 2 CRGTs were most susceptible in one case, but the inspectors identified that it did not include sufficient technical justification about what would be done to ensure adequate aging management of the Surry Unit 2 CRGTs. The licensee initiated CR435685 to enhance the ET to correct this issue.

This observation was addressed during the Surry Unit 1 license renewal Phase 1 inspection documented in NRC Inspection Report 2012009. The inspectors conducted the following inspections:

- The inspectors observed the one-time, focused inspection on the Surry Unit 1 reactor vessel components performed by the licensee which were based on the industry guideline MRP-228, "Materials Reliability Program: Inspection Standard for PWR Internals."

- The inspectors also reviewed the licensee's actions to verify that they have followed industry activities related to issues with Reactor Vessel Internals, that they have implemented activities for inspection of these components, and that they were based on industry guidelines. The inspectors also reviewed the current version of the UFSAR to verify the commitment had been incorporated in accordance with the license renewal application, the corresponding SER, and the licensee's response to the RAI, which incorporated the requirements of MRP-227, "Materials Reliability Program: Pressurized Water Reactor Internals Inspection And Evaluation Guidelines."

During this follow-up inspection, the inspectors verified that the licensee had incorporated the Reactor Vessel Internal inspections into the inspection activities scheduled for the Unit 2 refueling outage in the fall of 2012, including the inspection of CRGTs.

<u>Observation for Commitment Item 15 – Implement Changes into Procedures to Assure Consistent Inspection of Components for Aging Effects During Work Activities</u>

This observation identified that the licensee developed an aging effects "as-found" condition form, which was auto-generated whenever a preventive or corrective work order is made for maintenance on in-scope license renewal components, and was included in maintenance work order packages. The form provided instructions to maintenance personnel performing visual inspections of the inside surfaces of pressure retaining mechanical components within the scope of license renewal during preventive and corrective maintenance activities in order to document consistent descriptions of potential aging effects. If any of the identified aging effects were observed, the condition was described on the "as-found" condition form and a condition report was generated for entry into the Corrective Action Program. The use of the aging effects "as-found"

condition form was not employed for the structures credited by the Work Control Program (WCP) for aging management. The structures had specific inspection procedures initiated though the WCP at specific intervals. At the time of the inspection documented in NRC Inspection Report 2011010, these actions were still being evaluated by the licensee for their effectiveness in assuring consistent inspection of components for aging effects during work activities.

During this follow-up inspection, the inspectors reviewed the WCP process to verify that the licensee had implemented measures to ensure effective and consistent inspection of in-scope structures, systems, and components for aging effects during work activities.

Observation for Commitment Item 19 – Develop and Implement Inspection Program for Non-EQ Cables

This second observation for Commitment Item 19 identified that the licensee would monitor nuclear instrumentation cables for signs of aging. Section 18.1.4 of the UFSAR, "Non-Environmental Qualification (EQ) Cable Monitoring," stated, "The source, intermediate, and power range neutron detector operate with high-voltage power supply in conjunction with low-voltage signal cables. The routine calibration of these detectors will be used to identify the potential existence of aging degradation in the associated cables." During the Phase 2 license renewal inspection documented in NRC Inspection Report 2011010, the inspectors identified that the inspections of NI discussed in this Commitment Item had not been completed. The intent of this aging management program is to monitor the condition of the nuclear instrumentation cables for aging degradation of insulation. During that inspection, the inspectors determined that monitoring the results of the routine calibration of the NI system, as performed at Surry each refueling outage, would not achieve the intent of the program. At the time of that inspection, the licensee was considering changing this Commitment to develop and implement procedures for testing the cable resistance directly. This methodology is endorsed by Revision 2 of the GALL which states, "Cable system testing is conducted when the calibration or surveillance program does not include the cabling system in the testing circuit, or as an alternative to the review of calibration results described above, a proven cable system test for detecting deterioration of the insulation system (such as insulation resistance tests, time domain reflectometry tests, or other testing judged to be effective in determining cable system insulation condition as justified in the application) is performed."

There were no inspections conducted for this observation during this follow-up inspection. This observation was addressed during the Surry Unit 1 license renewal Phase 1 inspection documented in NRC Inspection Report 2012009. The results of that inspection included the review of the licensing basis, revised implementing procedures, and the updated final safety analysis report. The inspectors also directly observed the testing of power range NI-42 cables to verify that the cables showed no signs of deterioration or age related degradation, and verified that the testing of the nuclear instrumentation equipment, performed during the Unit 1 spring 2012 outage, was implemented as stated in the commitment and that changes made to the implementation of the commitment were updated in the appropriate documents.

b. Findings

No findings were identified. Based on the review of licensee actions completed at the time of this follow-up inspection, and the inspection results documented in NRC Inspection Reports 2012009 and 2011010, the inspectors determined that the licensee completed the necessary actions to meet all the Commitments selected for review. The inspectors identified the observation described below, which was entered into the Corrective Action Program for resolution.

Observation for Commitment Item 9 – Develop and Implement an Inspection Program for Infrequently Accessed Areas

The inspectors noted that the licensee performed inspections inside the Unit 2 containment as part of the Inspection Program for Infrequently Accessed Areas, in the area where the reactor instrumentation is located. Those inspections identified an apparent leak of the Neutron Shield Tank. This condition was initially identified in 1993 in Deviation Report S-93-0340 and identified in the licensee's Corrective Action Program in 2006 with CR 002459, when the leak was first monitored, with CR 149149 in 2009, and in 2011 with CR 221909, which covered the documentation and inspections for Neutron Shield Tank leakage.

The inspectors noted that the unidentified leak had been monitored for approximately 19 years and no evaluation had been performed to determine the specific location and size of the leak, and the impact of the leak on the structural function of the tank. The inspectors determined that the failure to identify the location and size of the leak in order to correct this condition, including the evaluation of adverse effects on the structural integrity of the tank, was a performance deficiency of minor significance involving a violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action." The inspectors determined that the performance deficiency was minor because the degraded condition would not adversely impact the safety function of the Neutron Shield Tank. The licensee issued CRs 479576 and 234722 to capture this issue in the Corrective Action Program, including the determination of the leak location, documenting the impact of the leak on the Neutron Shield Tank's safety function, and performing repairs as necessary. This failure to comply with 10 CFR 50, Appendix B, Criterion XVI constitutes a violation of minor significance that is not subject to enforcement action, in accordance with the NRC's Enforcement Policy.

4OA6 Management Meetings

.1 Exit Meeting Summary

On June 22, 2012, the inspectors presented the inspection results to members of the licensee management staff. The licensee acknowledged the inspection results. The inspectors confirmed that all proprietary information reviewed during the inspection was returned to the licensee and that none of the potential report input discussed was considered proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee
B. Garber, Licensing
J. Rosenberger, Engineering Programs Manager
H. Warren, Supervisor Engineering Programs
M. Groshner, License Renewal Fleet Program Owner

LIST OF REPORT ITEMS

None

LIST OF DOCUMENTS REVIEWED

Procedures
0-MCM-1207-01, Pumping of Security & Electrical Cable Vaults, Rev. 6
0-USP-K4, Intake Canal Ductline Sump Hi Lvl, Rev. 000
1-IPM-NI-IR-001, Nuclear Instrumentation Immediate Range N-35 & N-36 Cable Testing, Rev. 0
1-IPM-NI-N-42, Nuclear Instrumentation Power Range N-42 Cable Testing, Rev. 0
03-9178681.002, Procedure for Hold Down Spring Height Measurement Tool, Rev. 0
54-ISI-370-002, Nondestructive Examination Procedure for Remote Underwater Visual Inspection of Westinghouse Reactor Pressure Vessel Internals for Pressurized Water Reactors in Accordance with MRP-228 (Inspection Standard for PWR Internals), Rev. 0
51-9173320-001, Engineering Information Record Technical Justification for Examination of Westinghouse CRGT Guide Cards

Corrective Actions
CR474321 – Boric Acid buildup found in Incore Sump Room RP to Clean
CR234722 – Boric Acid Buildup in Incore Sump Room
CR234721 – Engineering to Evaluate BA in Incore Sump Room
CR208747 – Engineering to determine required action on BA in Incore Sump Room
CR221909 – Document and inspect for neutron shield tank leakage
CR457229 – Oil on floor behind the RCP oil collection tank
CR475239 – NRC inspector identified issue during containment walkdown with general corrosion on CC piping
CR479576 – Neutron Shield Tank Well Leakage

Drawings
11448-LRE-1A2, License Renewal Electrical Power Distribution One Line Integrated Schematic Surry Power Station – Unit 1, Rev. 0

Work Orders
38103129584, Inspect/Boroscope manhole as required, 3/8/12

Other Documents
ER-SU-5909, SPS program to inspect non-EQ Electrical Cables, Rev. 1

ETE-SU-2012-1013, Evaluation of Inspection Results for Manhole 00-EP-MH-DL2 IAW License Renewal Commitment 27
NUREG 1766, “Safety Evaluation Report Related to the License Renewal of North Anna Power Station, Units 1 and 2, and Surry Power Station, Units 1 and 2”
Surry Power Station-Updated Final Safety Analysis Report, Chapter 18, “Aging Management Programs and Activities”
UFSAR/ISFSI/SAR Change Request FS-2006-025, Periodic Monitoring of Affected Manholes for Corrective Action
CM-AA-ETE-101, Component Cooling Pipe in Containment Technical Evaluation