



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200  
ATLANTA, GEORGIA 30303

September 12, 2011

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, INSPECTION REPORT  
05000280/2011010 AND 05000281/2011010**

Dear Mr. Heacock:

On July 29, 2011, the U.S. Nuclear Regulatory Commission (NRC) completed a Post-Approval Site Inspection for License Renewal at your Surry Power Station Units 1 and 2. The enclosed report documents the inspection findings, which were discussed on July 29, 2011, with you and other 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.

Based on the results of this inspection, no findings were identified. However, the inspection identified eight observations that are subject to further NRC inspection to provide reasonable assurance that your license renewal commitments are met.

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 System (PARS) component of NRC's Agency wide 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/*

Joel Rivera-Ortiz, Acting Chief  
Engineering Branch 3  
Division of Reactor Safety

Docket No. 50-280, 50-281  
License No. DPR-32, DRP-37

Enclosure: Inspection Report 05000280/2011010 and 05000281/2011010  
w/Attachment: Supplemental Information

cc w/encl: (See Page 3)

accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

**/RA/**

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket No: 50-280, 50-281

License No: DPR-32, DRP-37

Report No: 05000280/2011010, 05000281/2011010

Licensee: Virginia Electric and Power Company

Facility: Surry Power Station, Unit 1 and 2

Location 5850 Hog Island Road  
Surry, VA 23883

Dates: July 11, 2011 – July 29, 2011

Inspectors: Louis Lake, Senior Reactor Inspector (Lead)  
Caudle Julian, Senior Construction Inspector  
Brendan Collins, Reactor Inspector  
Mike Coursey, Reactor Inspector  
Robert Williams, Reactor Inspector

Accompanying Staff: Robert Mathis, Construction Inspector Trainee

Approved by: Joel Rivera-Ortiz, Acting Chief  
Engineering Branch 3  
Division of Reactor Safety

Enclosure

## SUMMARY OF FINDINGS

IR 05000280,-281/2011010; 07/11/2011 – 07/29/2011; Surry Power Station, Unit 1 and 2; Post Approval Site Inspection for License Renewal.

The report covers a team inspection conducted by six regional inspectors in accordance with NRC Manual Chapter 2516 and NRC Inspection Procedure 71003.

The inspectors determined that commitments, license conditions, and regulatory requirements associated with the issuance of the renewed operating license were either being met or, where commitment actions had not been completed, that the licensee had generated tasks in their corrective action program (CAP) to track their completion before the period of extended operation.

The team identified eight observations, consisting of three issues of concern where if found during the period of extended operation (PEO) would be characterized as performance deficiencies in the NRC Reactor Oversight Process and five commitment items with pending actions where follow-up inspections are needed to provide reasonable assurance that commitments are met. All of these observations have been entered into the station's CAP.

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.

A. NRC-Identified and Self-Revealed Findings

None

B. Licensee-Identified Violations

None

## REPORT DETAILS

### 4. OTHER ACTIVITIES

#### 4OA5 Other Activities

##### .1 Post-Approval Site Inspection for License Renewal – IP 71003 (Phase 2)

###### a. Inspection Scope

###### (1) Implementation of License Conditions and Commitments, including Aging Management Programs

The inspectors reviewed supporting documents including implementing procedures, work orders, inspection reports, engineering evaluations, condition reports (CRs), and completed surveillance records; conducted interviews with licensee staff; performed visual inspection of structures, systems, and components (SSCs); and observed a sample of licensee activities related to license renewal commitments to verify the licensee completed the necessary actions to comply with the license conditions stipulated in the renewed facility operating license. The inspectors also verified that the licensee met the commitments associated with the Aging Management Programs (AMPs) described in NUREG-1766, "Safety Evaluation Report (SER) Related to the License Renewal of North Anna Power Station, Units 1 and 2, and Surry Power Station Units 1 and 2." For each AMP the inspectors verified that license renewal activities due prior to the period of extended operation (i.e. May 25, 2012) were implemented as described in the Updated Final Safety Analysis Report (UFSAR) supplement submitted pursuant to 10 CFR 54.21(d). For those license renewal action items that were not completed at the time of this inspection, the team verified that there was reasonable assurance that such action items were on track for completion prior to the period of extended operation or in accordance with an established implementation schedule. Commitment Items with pending actions requiring further inspection by the NRC are described in section 4OA5.1.b of this report.

The inspectors reviewed licensee actions that were completed (or scheduled) to meet the commitment items discussed below, which are described in Appendix D of NUREG 1766. Specific documents reviewed are listed in the report attachment.

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

This Commitment specified that the licensee would develop and implement inspection activities for representative samples of buried piping and valves. The inspection of each representative sample was to be performed one time between years 30 and 40 of the current operating license. The results of the above inspections were to be evaluated and form the basis for performing additional inspections, if needed.

The inspectors reviewed the licensing basis, program basis documents and implementing procedures. Except for the observation concerning copper-nickel piping identified in section 4OA5.1.b (1), the inspectors verified that these requirements were adequately translated into the UFSAR. The inspectors verified that program documents were administratively updated to reflect their applicability to the license renewal program,

interviewed the responsible plant personnel regarding this program and verified that the required procedural updates listed in the commitment were implemented.

Based on the review of licensee actions completed at the time of this inspection the inspectors determined that the licensee had not yet completed all the necessary actions to meet Commitment Item 1. For this reason, Commitment Item 1 will remain open, and is presented as an observation in section 4OA5.1.b (1) of this report.

#### Commitment Item 2 – Add Pressurizer (PZR) Surge Line to Augmented Inspection Program

This Commitment specified that the PZR Surge Line would be added to the licensee's Augmented Inspection Program. The licensee performed a detailed fatigue analysis using American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME BPVC), Section III, Article NB-3222.4(e) to assess the most susceptible PZR Surge Line component and determined this to be the weld connecting the PZR Surge Line to the Reactor Coolant Hot Leg. The licensee's approach to meeting Commitment Item 2 was to add the Surge Line-Hot Leg weld to the Augmented Inspection Program, and based on the results of the inspections on that weld, inspections of other Surge Line welds might be performed.

The inspectors reviewed the licensee's Augmented Inspection Program to verify that approach had been effectively added to the program. At the time of this inspection, the initial inspections required to be performed on the Surge Line-Hot Leg welds prior to entering the PEO had been completed on both units. The inspectors reviewed the procedures used to perform these inspections as well as the results to verify the inspections were performed in accordance with ASME BPVC requirements. The inspectors also reviewed the current version of the UFSAR to verify the commitment had been implemented in accordance with the license renewal application (LRA) and the corresponding SER.

At the time of this inspection, this commitment item was partially completed and additional tasks were pending to be implemented prior to the period of extended operation. The inspectors reviewed the existing procedures and draft proposed procedures to verify that the inspections were implemented as stated in the commitment.

Based on the review of licensee actions completed at the time of this inspection, the timeliness of those actions, and the administrative controls in place to track pending actions, the inspectors determined that there was reasonable assurance that the licensee would complete the necessary actions to meet Commitment Item 2.

#### Commitment Item 3 – Add Core Barrel Hold-Down Spring to Augmented Inspection Program

This Commitment specified that the Core Barrel Hold-Down Spring would be added to the licensee's Augmented Inspection Program.

The inspectors reviewed the licensee's Augmented Inspection Program to verify that the Core Barrel Hold-Down Spring had been added to the program. At the time of this inspection, the initial inspections required to be performed prior to entering the PEO had been completed on both units. The inspectors reviewed the procedures used to perform



these inspections as well as the results to verify the inspections were performed in accordance with ASME BPVC requirements. The inspectors also reviewed the current version of the UFSAR to verify the commitment had been implemented in accordance with the LRA and the corresponding SER.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee completed the necessary actions to meet Commitment Item 3.

#### Commitment Item 4 – Expand Scope of the Civil Engineering Structural Inspection to Cover License Renewal Requirements

This Commitment specified that the scope of the civil engineering structural inspection program would be expanded to cover license renewal requirements.

The inspectors reviewed the licensing basis, program basis documents and implementing procedures. The inspectors verified that program documents were administratively updated to reflect their applicability to the license renewal program. The inspectors also interviewed the responsible plant personnel. The licensee revised Technical Report CE-0087 “Guideline for Monitoring of Structures” to incorporate the additional requirements to support license renewal. Structures included within the scope of license renewal were identified in this technical report. A formal inspection of structures would be performed every five years in accordance with Engineering Surveillance Procedure 0-NSP-BS-005 and Technical Report CE-0087. A work order would be generated for these inspections by the Periodic Test Scheduling System (PTSS). Inspections of opportunity would be performed by the licensee for normally inaccessible and infrequently accessed areas, also in accordance with the Engineering Surveillance Procedure and Technical Report.

Based on the review of licensee actions completed at the time of this inspection, the timeliness of those actions, and the administrative controls in place to track pending actions, the inspectors determined that there was reasonable assurance that the licensee would complete the necessary actions to meet Commitment Item 4

#### Commitment Item 5 – Revise Plant Documents to Use Inspection Opportunities When Inaccessible Areas Become Accessible During Work Activities

This Commitment specified that procedures would be revised to control the inspection of inaccessible and infrequently accessed areas when they become available.

The inspectors reviewed Technical Report LR 1768/LR 2768, “Inspection of Infrequently Accessed Areas,” and surveillance procedure NSP-BS-005, “Monitoring Structures.” The technical evaluation identified inspection activities for infrequently accessed areas that were inspected in accordance with surveillance procedure NSP-BS-005. The inspectors also reviewed Administrative Procedure WM-AA-100, “Work Control Process,” that identified when these areas become available for inspection. The technical report and surveillance procedure identified that these inspections are required to be performed one-time only between year 30 and the end of the current operating license and that these inspections determine the condition of structures, supports, piping, and equipment by visual examination to detect aging effects such as loss of material, cracking and changes in material properties (such as indicated by separation,

delamination or changes in color). Additional periodic inspections would be determined by engineering evaluation of the one-time inspection results.

With the addition of this activity, the effects of aging for systems, structures, and components in infrequently accessed areas would be adequately managed so that there is reasonable assurance that components will continue to perform their intended functions, consistently with the current licensing basis, during the extended period of operation.

Based on the review of licensee actions completed at the time of this inspection, the timeliness of those actions, and the administrative controls in place to track pending actions, the inspectors determined that there was reasonable assurance that the licensee would complete the necessary actions to meet Commitment Item 5

#### Commitment Item 6 – Incorporate NFPA-25, Section 2-3.1.1 for Sprinklers

This Commitment specified that the National Fire Protection Association (NFPA) standard NFPA-25, section 2-3.1.1 for sprinklers would be incorporated in the fire protection program at Surry. That action would require the replacement or testing of a representative sample of sprinkler heads that have been in service for 50 years. The inspectors found that the commitment was being tracked by CR 427521. The CR stated that Surry intends to replace sprinkler heads prior to their 50 years in service. This work was being implemented by Project Number 38697 which would replace sprinkler heads starting in July 2011 and end by July 2021 prior to Unit one's 50<sup>th</sup> year with 155 of the sprinklers replaced each year. The CR also directed that plant procedure CM-AA-FPA-100, "Fire Protection/Appendix R (Fire Safe Shutdown) Program" be modified to include this commitment. The inspectors examined Revision 4 of that procedure and found that the commitment had been incorporated. The inspectors concluded that this commitment was being tracked acceptably and there was reasonable assurance that the actions would be accomplished in the specified time.

Based on the review of licensee actions completed at the time of this inspection, the timeliness of those actions, and the administrative controls in place to track pending actions, the inspectors determined that there was reasonable assurance that the licensee would complete the necessary actions to meet Commitment Item 6.

#### Commitment Item 7 – Develop Inspection Criteria for Non-ASME Supports and Doors

This Commitment specified that the licensee will develop inspection criteria for non-ASME Section XI component supports and doors as part of general condition monitoring. Initial inspections using the developed criteria were to be completed prior to the end of the current operating license.

The inspectors reviewed the licensing basis, program basis documents, implementing procedures and inspection results for inspections performed on both units. The inspectors verified that program documents were administratively updated to reflect their applicability to the license renewal program and also verified that these requirements were adequately translated into the UFSAR. Additionally, the inspectors interviewed the responsible plant personnel regarding these documents, verified that no outstanding tasks remained open for this commitment as well as reviewed a sample of examination results that implemented the newly developed inspection criteria.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee demonstrated completion of Commitment Item 7.

Commitment Item 8 – Develop Procedural Guidance for Inspection Criteria That Puts Focus on Aging Effects

This Commitment specified that the licensee would develop procedural guidance for engineers and health physics technicians regarding inspection criteria that focus on the detection of aging effects during general condition monitoring activities. The developed criteria were to be completed prior to the end of the current operating license. In support of this commitment, the licensee developed a “Walkdown Checklist” that identified specific aging effects. This checklist was to be included with all applicable work control packages.

The inspectors reviewed the licensing basis, program basis documents, updated implementing procedures, newly developed procedures and relevant condition reports. The inspectors verified that program documents were administratively updated to reflect their applicability to the license renewal program and also verified that these requirements were adequately translated into the UFSAR. Additionally, the inspectors interviewed the responsible plant personnel regarding these documents and verified that no outstanding tasks remained open for this commitment.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee demonstrated completion of Commitment Item 8.

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

This Commitment specified that the licensee would develop and implement an inspection program for infrequently accessed areas. Implementation of the developed inspection program was to be performed one time between years 30 and 40 of the current operating license. The results of the inspections from the developed program were to be evaluated and form the basis for performing additional inspections, if needed.

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 licensee has listed this Commitment Item as open pending the completion of inspections and evaluations for all infrequently accessed areas that fall under this program scope. For this reason, Commitment Item 9 will remain open, and is presented as an observation in section 4OA5.1.b (4) of this report.

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

This Commitment specified that the licensee would implement inspections for a representative sample of tanks that require aging management for license renewal. The inspection of each representative sample was to be performed one time between years 30 and 40 of the current operating license. The results of the above inspections were to be evaluated and form the basis for performing additional inspections, if needed.

The inspectors reviewed the licensing basis, program basis documents and implementing procedures. The inspectors verified that program documents were administratively updated to reflect their applicability to the license renewal program as well as performed an independent walkdown of a representative sample of tanks. Additionally, the inspectors interviewed the responsible plant personnel regarding this program and verified that evaluations of the one-time tank inspections, that will form the basis for any additional needed inspections, were being adequately tracked by the licensee's CAP.

The licensee has listed this Commitment Item as open pending the completion of the above mentioned inspection evaluations. For this reason, Commitment Item 10 will remain open, and is presented as an observation in section 4OA5.1.b (5) of this report.

#### Commitment Item 11 – Follow Industry Activities Related to Failure Mechanisms for Small Bore Piping. Evaluate Changes to Inspection Activities Based on Industry Recommendations

This Commitment specified that the licensee would follow industry activities related to failure mechanisms for small-bore piping and to evaluate changes to their inspection activities based on industry recommendations. The inspectors found that the licensee was participating in the Electric Power Research Institute (EPRI) sponsored Materials Reliability Project (MRP) industry task group on thermal fatigue caused by cyclic thermal stratification and environmental effects and had placed this license renewal commitment into an on-going status. The inspectors also noted that the licensee's ASME Section XI program conducted visual inspections of small-bore socket welds and visual and volumetric inspections of small-bore butt welds.

The inspectors reviewed the licensing basis, program basis documents, implementing procedures and relevant condition reports. The inspectors verified that these requirements were adequately translated into the UFSAR. The inspectors verified that program documents were administratively updated to reflect their applicability to the license renewal program, interviewed the responsible plant personnel regarding this program and verified that the required procedural updates listed in the commitment were implemented.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee demonstrated completion of Commitment Item 11.

Commitment Item 12 – Follow Industry Activities Related to Core Support Lugs. Evaluate Need to Enhance Inspection Activities Based on Industry Recommendations

This Commitment specified that the licensee would follow industry activities related to Core Support Lugs and evaluate the need to enhance inspection activities based on industry recommendations. ASME BPVC Section XI, Table IWB-2500-1 requires core support structures to be inspected during each 10-year Inspection Interval.

The inspectors reviewed the licensee's actions to verify that they have followed industry activities regarding Core Support Lugs and that they have evaluated the need to enhance inspections based on industry recommendations. At the time of this inspection, the ASME BPVC inspections required to be performed in the current Inspection Interval had been completed. The inspectors reviewed the procedures used to perform these inspections as well as the results to verify the inspections were performed in accordance with ASME BPVC requirements. The inspectors also reviewed the current version of the UFSAR to verify the commitment had been implemented in accordance with the LRA and the corresponding SER.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee completed the necessary actions to meet Commitment Item 12.

Commitment Item 13 – Inspect Representative Sections of Polar Crane Box Girders

This Commitment specified that a one-time inspection of representative sections of polar crane box girders would be performed between years 30 and 40. Additional inspections would be based on the results from the initial inspection.

The inspectors verified that program documents were administratively updated to reflect their applicability to the license renewal program. The licensee performed inspections on Unit 1 under work order 00488943-01 on 05/19/2003 and Unit 2 under work order 00494231-01 on 10/22/2003. Both work orders indicated the inspection of the accessible areas of the Polar Crane box girders were satisfactory with no additional inspections or repairs required during the PEO.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee completed the necessary actions to meet Commitment Item 13.

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

This Commitment specified that the licensee would follow industry activities related to Reactor Vessel Internals such as void swelling, thermal and neutron embrittlement, and to evaluate industry recommendations for these components.

The inspectors reviewed the licensee's actions to verify that they have followed industry activities related to issues with Reactor Vessel internals and that they have implemented activities for inspection of these components based on industry recommendations. The

inspectors also reviewed the current version of the UFSAR to verify the commitment had been implemented in accordance with the LRA and the corresponding SER.

At the time of this inspection, this commitment item was partially completed and additional tasks were pending to be implemented prior to the period of extended operation. The inspectors reviewed the existing procedures and draft proposed procedures to verify that the inspections were implemented as stated in the commitment.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee had not yet completed the necessary actions to meet Commitment Item 14. For this reason, Commitment Item 14 will remain open, and is presented as an observation in section 4OA5.1.b (6) of this report.

Commitment Item 15 – Implement Changes Into Procedures to Assure Consistent Inspection of Components for Aging Effects During Work Activities

This Commitment specified that the licensee would implement changes into procedures to assure consistent inspection of components for aging effects during work activities.

The inspectors reviewed Plant Issue Resolution S-2003-2444-R15, UFSAR sections 18.2.19 and Table 18.1, and actions taken to implement changes in plant procedures to assure consistent inspection of components. UFSAR change request FS-2004-009, dated 05/27/2004, stated in part, "Implementation of consistent inspections is accomplished using automated inspection instruction for work orders involving components and structures that have been identified as requiring aging management. The instructions consistently require inspections to identify a variety of aging mechanisms required for the renewed operating licenses."

Dominion Nuclear Fleet Guidance and Reference Document (GARD) ER-AA-AMP-1005, "Tracking and Trending of Inspection Results for License Renewal Systems, Structures and Components" provided instructions for tracking and trending inspection results for systems, structures and components that have been evaluated to require license renewal aging management and are monitored through work control process (WCP). The licensee also developed an aging effects "as-found" condition form that was included in maintenance work orders packages for inspection of in-scope license renewal components.

The above actions were still being evaluated by the licensee for their effectiveness in ensuring consistent inspection of components for aging effects during work activities. Therefore, based on the review of licensee actions completed at the time of this inspection, the inspectors determined that the licensee had not yet completed the necessary actions to meet Commitment Item 15. For this reason, Commitment Item 15 will remain open, and is presented as an observation in section 4OA5.1.b (7) of this report.

Commitment Item 16 – Incorporate Ground Water Monitoring into the Civil Engineering Structural Monitoring Program. Consider Groundwater Chemistry in Engineering Evaluations of Deficiencies.

This Commitment specified that groundwater monitoring would be incorporated into the civil structural monitoring program. Specifically, engineering evaluations of deficiencies should consider groundwater chemistry as a potential factor.

The inspectors reviewed the licensing basis, program basis documents, the UFSAR and implementing procedures. The inspectors verified that program documents were administratively updated to reflect their applicability to the license renewal program. The inspectors also interviewed the responsible plant personnel. Chemistry Surveillance Procedure 0-CSP-PL-001 was implemented to perform monitoring of groundwater chemistry parameters such as pH, chloride concentration, and sulfate concentration. Technical Report CE-0087, Guidelines for Monitoring of Structures, required the consideration of groundwater chemistry as a potential factor when evaluating identified structural deficiencies.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee completed the necessary actions to meet Commitment Item 16.

Commitment Item 17 – Incorporate Management of Concrete Aging into the Civil Structural Monitoring Program and the Infrequently Accessed Area Inspection Program

This Commitment specified that the licensee would incorporate the management of concrete aging into the civil structural monitoring program and the infrequently accessed area inspection program.

The inspectors reviewed the licensing basis, program basis documents, the UFSAR and implementing procedures. The inspectors verified that program documents were administratively updated to reflect their applicability to the license renewal program. The inspectors also interviewed the responsible plant personnel. Engineering Surveillance Procedure 0-NSP-BS-005 was developed as an implementing procedure for Technical Report CE-0087. Procedure 0-NSP-BS-005 was used to perform inspections of opportunity for inaccessible and infrequently accessed areas of the plant, using the guidance of Technical Report CE-0087.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee completed the necessary actions to meet Commitment Item 17.

Commitment Item 18 – Incorporate Management of Elastomers into the Work Control Activities

This Commitment specified that the licensee will incorporate the management of elastomers into the work control activities. The scope of the elastomers included gaskets associated with the containment o-ring, reactor cavity seal, containment personnel hatch, electric terminal, junction and pull boxes, low level intake structure

flood barriers, seals used in expansion joints and miscellaneous fire barrier penetration seals.

The inspectors reviewed the licensing basis, program basis documents and implementing procedures. The licensee performed a review of existing procedures and found that inspection activities existed for all in-scope elastomers except the gaskets associated with the electrical terminal, junction and pull boxes and subsequently updated the corresponding procedures. The inspectors also verified that existing site procedures GMP-031, "Emergency Service Water (ESW) Pump House Stop Log Installation and Removal" and 0-STP-70.7, "Annual Intake Canal Liner Visual Inspection/Acceptance Test" were updated to ensure that the inspections of elastomers looked for both damage and aging. The inspectors verified that program documents were administratively updated to reflect their applicability to the license renewal program and also verified that these requirements were adequately translated into the UFSAR. Additionally, the inspectors interviewed the responsible plant personnel regarding these documents and verified that no outstanding tasks remained open for this commitment.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee demonstrated completion of Commitment Item 18.

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

This Commitment specified that a program to perform periodic visual inspections of non-environmentally qualified (EQ) cables to detect the effects of aging for cables located in high radiation, high temperature or wetted environments would be developed. The licensee's response to an NRC Request for Additional Information (RAI) in letter serial number 02-360 dated July 25, 2002 specified that between year 30 and 40 of operation the licensee will perform an initial inspection of a representative sample of non-EQ power instrumentation, and control cable jackets and connectors for indicated aging effects requiring aging management. These effects could be due to high radiation, high temperature, or wetted condition environments. Subsequent inspections to confirm ambient conditions would be scheduled at least once per 10 years following the initial inspection. The first walkdowns were performed on August 25, 2004, November 9, 2004, and November 2, 2006. The inspectors examined document ET-CEP-04-0021, "Results of First Non-EQ Cable Inspection." That record reflected that the initial visual inspections were completed as committed and no significant effects of aging were observed. Future inspections would be performed under recurring event RE 96249 and work order 38103030549 by August 30, 2014 with a late performance due date of November 28, 2016. The inspectors concluded that this portion of Commitment 19 has been met in that the initial inspections were performed and future inspections are scheduled in the licensee's work control system.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee had not yet completed the necessary actions to meet Commitment Item 19. For this reason, Commitment Item 19 will remain open, and is discussed Sections 4OA5.1.b (2) and 4OA5.1.b (8) of this report.



Commitment Item 20 – Follow Industry Activities Related to Alloy 82/182 Weld Material. Implement Activities Based on Industry Recommendations, as Appropriate

This Commitment specified that the licensee would follow industry activities related to Alloy 82/182 weld material and implement activities based on industry recommendations, as appropriate. This commitment also specified that the existing Alloy 600 Management Plan manages the aging effects for Alloy 82/182 material. The program description stated that the program incorporates requirements of Electric Power Research Institute (EPRI) Materials Reliability Program (MRP)-139, "Primary System Piping Butt Weld Inspection and Evaluation Guideline," which covers a large portion of the known issues with Alloy 82/182 weld material.

The inspectors reviewed the licensee's actions to verify that they have followed industry activities regarding Alloy 82/182 weld material and that they have implemented activities for Alloy 82/182 based on industry recommendations. This review showed that the existing Alloy Management Plan managed the aging effects for Alloy 82/182 material and that this program incorporated the requirements of EPRI MRP-139. The inspectors also reviewed the current version of the UFSAR to verify the commitment had been implemented in accordance with the LRA and the corresponding SER.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee completed the necessary actions to meet Commitment Item 20.

Commitment Item 21 – Inspectors Credited in the Work Control Process will be QMT or VT Qualified

This Commitment specified that inspectors credited in the work control process would be QMT (Quality Maintenance Team) or VT (Visual Testing) qualified. At the time the LRA was submitted it was assumed that inspectors qualified as QMT were required to go through VT training as part of their QMT qualification. Later the licensee determined this was not the case. Subsequently, the licensee concluded that all inspectors performing license renewal inspections will be VT qualified only. A revision to the Work Order License Renewal As-Found Sheet in the licensee's computerized work control process, named MAXIMO, was updated to reflect this requirement. Engineering Technical Evaluation ETE-SU-2010-0022 was developed in order to explain this commitment.

The inspectors reviewed Engineering Technical Evaluation ETE-SU-2010-0022, Work Management Procedure WM-AA-100, and SER section 3.3.1.19, UFSAR A2.22.18, SAR Change SPS-UCR-2011-011, and SAR Change SPS-UCR-2011-022.

Based on the review of licensee actions completed at the time of this inspection, the timeliness of those actions, and the administrative controls in place to track pending actions, the inspectors determined that there was reasonable assurance that the licensee would complete the necessary actions to meet Commitment Item 21.

Commitment Item 22 – Perform Audit of Work Control Inspections to Ensure Representation by All In-Scope License Renewal Systems and to Determine Need for Supplemental Inspections

This Commitment specified that an audit of work control inspections would be performed prior to the period of extended operation to ensure representation by all in-scope license renewal systems and to determine the need for supplemental inspections. This commitment also specified an audit be conducted every 10 years thereafter and supplemental inspections within 5 years of the audit.

The inspectors reviewed Engineering Technical Evaluation ETE-SU-2011-0023 that evaluated the audit that was conducted in September 2010. Audit results identified that the work control process had not completed inspections for the total population of material/environmental and component group combinations credited for license renewal. Supplemental inspections were needed for those groups where inspections could not be confirmed. This condition was entered into the station's CAP as CR 428509. An audit to confirm these inspections was scheduled to be performed within 5 years, as required by Commitment 22.

The inspectors also reviewed Work Request 2298, dated 5/31/11. This WR identified the use of a "License Renewal Flag" to identify when work is being performed on components within the scope of the license renewal.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee completed the necessary actions to meet Commitment Item 22.

Commitment Item 23 – Measure the Sludge Buildup in the Service Water Reservoir at North Anna Power Station

This Commitment Item was not applicable to Surry Power Station.

Commitment Item 24 – Provide Inspection Details for PZR Surge Line Inspections to the NRC for Review and Approval

This Commitment specified that the licensee would provide inspection details for the PZR Surge Line inspections to the NRC for review and approval. As described previously in Item 2, the licensee performed detailed analysis of the PZR Surge Line and determined the most susceptible component to be the Surge Line-Hot Leg weld. The licensee's Augmented Inspection Program stated that inspections will be performed on this weld using the requirements of and consistent with the frequency suggested by ASME BPVC Section XI. The licensee planned to evaluate the results of those inspections to determine if any inspections are required for the remaining Surge Line components. This entire process was implemented by adding the Surge Line-Hot Leg weld to the Augmented Inspection Program.

The inspectors reviewed the licensee's Augmented Inspection Program to verify that approach had been effectively added to the program. At the time of this inspection, the initial inspections required to be performed on the Surge Line-Hot Leg weld prior to entering the PEO had been completed on both units. The inspectors reviewed the

procedures used to perform these inspections as well as the results to verify the inspections were performed in accordance with ASME BPVC requirements. Additionally, the inspectors confirmed that the inspection details for the PZR Surge Line were provided to the NRC for review and approval. The inspectors also reviewed the current version of the UFSAR to verify the commitment had been implemented in accordance with the LRA and the corresponding SER.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee completed the necessary actions to meet Commitment Item 24.

#### Commitment Item 25 – Provide Inspection Details for Safety Injection (SI) and Charging Line Inspections to the NRC for Review and Approval

This Commitment specified that the licensee would provide inspection details for the SI and charging line inspections to the NRC for review and approval. The licensee performed a detailed fatigue analyses using ASME BPVC Section III, Article NB-3222.4(e) to assess the components on the SI and Charging lines and determined that none of the components on either of these two lines exceeded the numerical factors which would have defined them as susceptible components. For this reason, no program to inspect these components will be implemented for license renewal purposes.

The inspectors confirmed that the inspection details for the SI and Charging lines have been provided to the NRC for review and approval. The inspectors also reviewed the current version of the UFSAR to verify the commitment had been implemented in accordance with the LRA and the corresponding SER.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee completed the necessary actions to meet Commitment Item 25.

#### Commitment Item 26 – Address NRC Staff Final Guidance Regarding Fuse Holders When Issued

This Commitment specified that the licensee would address the NRC staff final guidance regarding fuse holders when the guidance was issued. Section 18.1.4 of the UFSAR, "Non-Environmental Qualification (EQ) Cable Monitoring," also stated, "additionally, a commitment for the renewed operating licenses required that upon issuance of staff guidance regarding the aging management of fuse holders in power circuits, the non-EQ cable monitoring program was to be revised to address the guidance (Item 26, Table 18-1). Guidance was issued by the NRC in Revision 1 of the Generic Aging Lessons Learned (NUREG-1801). Implementation of the required surveillance included reviews of station drawings, listings of station fuses, and plant walkdowns. These efforts identified no fuse holders that are affected by this license renewal requirement." The inspectors reviewed document ET-CEP-05-0020, License Renewal Fuse Holder Walkdown – Surry Power Station Commitment 26, Rev. 0, 2/6/06. The document described the licensee's review of all the lists of power fuses for Surry. The lists included numerous power fuses but none were located outside of active devices, which would require them to be in license renewal scope. The document further described that the licensee performed a walkdown on August 25, 2005 of appropriate buildings where fuses might be located and found none. The licensee concluded that no power fuse

holders existed at Surry Power Station outside of active devices that would require aging management. The inspectors found this conclusion acceptable.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee completed the necessary actions to meet Commitment Item 26.

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

This Commitment specified that prior to the period of extended operation a program to control water intrusion into manholes would be developed and implemented. Section 18.1.4 of the UFSAR stated that the potentially adverse localized environment due to moisture which could lead to water-treeing in high or medium-voltage cables that are within the scope of license renewal, would be detected by visually monitoring for the presence of water around cables and programs utilizing periodic inspections. Additionally, design features such as drains or sump pumps would be used to control the cable localized environment. Section 18.1.4 of the UFSAR also stated that a maintenance surveillance procedure would be used to periodically determine the extent of water in manholes of interest for license renewal so that corrective actions can be taken to avoid having the cable remain wetted. Technical Report LR-1772/LR-2772 Rev. 6, "License Renewal Aging Management Activities: Non-EQ Cable Monitoring Surry and North Anna Power Stations", identified procedure 0-MCM-1207-01, "Pumping of Security and Electrical Cable Vaults", as providing the required periodic confirmation that cables are not wetted for a significant duration.

The inspectors reviewed the licensing basis, program basis documents, implementing procedures, applicable condition reports, and work orders; and interviewed the responsible plant personnel regarding these documents. The inspectors verified, through review of plant drawings of selected manholes, the existence of design features that included level alarm switches and sump pumps to control the localized environment of cables within license renewal scope.

At the time of this inspection, this commitment item had not been completed and the licensee needed to take necessary 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 to meet Commitment Item 27. Thus, Commitment 27 is subject to further NRC inspection to ensure timely and technically acceptable completion.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee had not yet completed the necessary actions to meet Commitment Item 27. For this reason, Commitment Item 27 will remain open, and is discussed further in section 4OA5.1.b (3) of this report.

Commitment Item 28 – Revise Procedures for Groundwater Testing to Account for Possible Seasonal Variations

This Commitment specified that the licensee would revise procedures for groundwater testing to account for possible seasonal variations.

The inspectors reviewed the licensing basis, program basis documents, the UFSAR and implementing procedures. The inspectors verified that program documents were administratively updated to reflect their applicability to the license renewal program. The inspectors also interviewed the responsible plant personnel. Chemistry Surveillance Procedure 0-CSP-PL-001, "Subsurface Drain Chemistry," performed quarterly monitoring of the groundwater chemistry parameters pH, chloride concentration, and sulfate concentration. This information supported the engineering evaluations of potentially degraded structures. As such, Technical Report CE-0087, Guideline for Monitoring of Structures was revised to incorporate the additional guidance to consider seasonal groundwater variations.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee completed the necessary actions to meet Commitment Item 28.

Commitment Item 29 – Inspect Similar Material/Environment Components, Both Within the System and Outside the System, If Aging Identified in a Location Within the System Cannot be Explained by Environmental/Operational Conditions at that Specific Location

This Commitment specified that the licensee would inspect similar material/environment components, both within the system and outside the system, if aging identified in a location within a system cannot be explained by environmental/operational conditions at that specific location.

UFSAR change request FS-2004-037, dated 12/09/2004, stated that: "Whenever evidence of aging effects exists, an engineering evaluation is performed to determine whether the observed condition is acceptable without repair. Occurrence of significant aging effects that is adverse to quality is entered into the Corrective Action System." If the evaluation of an anomalous condition indicated that the occurrence was unexpected for the operational conditions involved, the work control process would ensure that locations with similar material and environmental conditions were inspected as directed by a Station procedure (ITEM 29, Table 18-1). UFSAR, Chapter 18.2.19 was revised to implement the above commitment.

Dominion Nuclear Fleet Guidance and Reference Document (GARD) ER-AA-AMP-1005, "Tracking and Trending of Inspection Results for License Renewal Systems, Structures and Components" provided instructions for tracking and trending results for systems, structures and components that had been evaluated to require license renewal aging management and were monitored through the work control process. When a condition adverse to quality is noted in a system under the license renewal scope, this procedure required a search for components under license renewal scope that are made of similar materials and operating in a similar environment to perform monitoring or inspection of those components as required.

Based on the review of licensee actions completed at the time of this inspection, the timeliness of those actions, and the administrative controls in place to track pending actions, the inspectors determined that there was reasonable assurance that the licensee would complete the necessary actions to meet Commitment Item 29.

Commitment Item 30 – Supplement the NFPA Pressure and Flow Rate Testing Credited in Each LRA as Part of the Fire Protection Program Activity with the Work Control Process Activity in Order to Manage Aging Effects for the Fire Protection System Piping

This Commitment specified that the Surry Fire Protection Program, which was credited for license renewal as an existing aging management program, would be supplemented with the work control process prior to the PEO. The work control process would provide numerous opportunities to perform internal inspections of fire protection piping when it is opened for maintenance. The licensee enhanced the Surry electronic WCP by including, in each new work order, a form titled License Renewal As-Found Inspection. This form was required to be filled out to document the “as-found” conditions relevant to license renewal for the inside surfaces of pressure retaining mechanical components, such as piping components, valve bodies, tanks, pump casings, heating ventilation and air conditioning (HVAC) ducting, and damper housings, when they are made available for inspections. The form was also used for license renewal documentation of hardware inspections other than fire protection equipment. The form stated that it was not required to be filled out for work not in the scope of license renewal and gave examples of such. When an inspection was not required, a cognizant supervisor was required to sign the form. Otherwise, an inspection was performed for evidence of aging effects on inside surfaces and documented on the form.

The inspectors reviewed document ETE-SU-2011-0059, “Justification for Surry’s Compliance of License Renewal Commitment Item 30” and reviewed procedure WM-AA-100, “Work Control,” which was the corporate procedure to implement this license renewal commitment. The inspectors observed that the procedure did not contain an explanation of the origin, significance, methodology, or use of the form License Renewal As-Found Inspection. In response to the inspectors’ comments, the licensee initiated CR 435801. The inspectors sampled fire protection WOs from the past year to confirm that the form was being used. No instance was found where the form was not filled out.

Based on the review of licensee actions completed at the time of this inspection and the timeliness of those actions, the inspectors determined that the licensee completed the necessary actions to meet Commitment Items 30.

(2) License Renewal Commitment Changes

As part of the review of the commitments identified in Appendix D of the SER, the inspectors reviewed license renewal commitment change documents to verify the licensee followed the guidance in NEI 99-04, “Guidelines for Managing NRC Commitment Changes,” for any change to the commitments, including their elimination. The inspectors verified that the licensee properly evaluated, reported, and approved where necessary, changes to license renewal commitments listed in the UFSAR in accordance with 10 CFR 50.59.

The inspectors also reviewed the licensee’s procedures for commitment revision to ensure that future changes to (or elimination of) license commitments would follow the guidance in NEI 99-04, and would properly evaluate, report, and approve changes to license renewal commitments listed in the UFSAR in accordance with 10 CFR 50.59.

The inspectors did not identify any examples where commitment changes were not consistent with the guidance in NEI 99-04.

(3) Newly Identified SSCs

After the renewed license is issued, the FSAR update required by 10 CFR 50.71(e) must include any SSCs newly identified that would have been subject to an aging management review or time-limited analysis in accordance with 10 CFR 54.21. The FSAR update must describe how the effects of aging are managed such that the intended function(s) in 10 CFR 54.4(b) will be effectively maintained during the period of extended operation.

The inspectors discussed the identification of new SSCs under the purview of 10 CFR 54.37(b), with the licensee's staff. The licensee indicated that no components had been identified that should have been within the scope of its license renewal program due to discovering components in the plant that were not accurately reflected in the database used to originally generate the application for a renewed license. Additionally, the inspectors reviewed a sample of modifications implemented since the LRA was submitted to the NRC until the date the renewed operating license was issued to identify any potential new SSCs that should have been subject to aging management review at the time the NRC was reviewing the LRA. The inspectors also reviewed the licensee's evaluation of Regulatory Issue Summary 2007-16 to verify that the newly identified SSCs in that generic communication were considered in the scope of Surry's license renewal.

The inspectors determined that the licensee took appropriate actions to assure newly identified structures, systems, and components were properly identified and evaluated for management of aging effects. The inspection team did not identify any new SSCs that were subject to the provisions of 10 CFR 54.37(b).

(4) Description of AMPs in the UFSAR Supplement

As part of the review of AMPs approved by the NRC in the SER, the inspectors reviewed their UFSAR descriptions to confirm the implemented programs were consistent with the SER. The inspectors also verified that changes caused by the inclusion of "newly identified" SSCs were included in the UFSAR supplement. With the exception of one example described in section 4OA5.1.b(1) of this inspection report, the inspectors did not identify inconsistencies between the AMPs approved in the SER and the UFSAR supplement.

The inspectors reviewed changes made to the programs and activities in the UFSAR supplement from the date the renewed license was issued to the next scheduled UFSAR update to verify that changes were evaluated against the criteria in 10 CFR 50.59. The inspectors found that the aforementioned supplement was included in the UFSAR as required and changes to the programs and activities were evaluated in accordance with 10 CFR 50.59.

(5) Operating Experience

The inspectors also reviewed licensee actions in response to recent industry operating experience and its impact on the plant's aging management programs. Surry's renewed

license for the PEO was issued in 2003 and a significant amount of industry operating experience has been identified since that time. This operating experience and its impact on aging management programs have been captured, in part, in license renewal guidance documents including NUREG 1801, "Generic Aging Lessons Learned (GALL) Report," Revision 1 and Revision 2, and Regulatory Information Summary (RIS) 2011-05, "Information on Revision 2 to the Generic Aging Lessons Learned Report for License Renewal of Nuclear Power Plants."

The inspectors selected the operating experience items listed below which are discussed, in part, in RIS 2011-05 to verify the licensee adequately addressed recent lessons learned in these areas. Specifically, the inspectors interviewed licensee personnel and reviewed license renewal documents associated with the commitment items and aging management programs for which these operating experience items applied. Based on the review of licensee actions the inspectors determined that the licensee addressed this operating experience.

- Fatigue Monitoring
- Reactor Head Closure Stud Bolting
- Cracking of Nickel-Alloy Components and Loss of Material Due to Boric Acid-Induced Corrosion
- Steam Generators
- One-Time Inspection and Selective Leaching
- One-Time Inspection of ASME Class 1 Small-Bore Piping
- External Surfaces Monitoring of Mechanical Components and Inspection of Internal Surfaces in Miscellaneous Piping and Ducting
- Flux Thimble Tube Inspection
- Neutron-Absorbing Materials Other than Boraflex
- Buried Piping and Tanks
- Subsection IWE of Section XI
- Masonry Walls
- Structures Monitoring Program
- Protective Coating Monitoring and Maintenance
- Inaccessible Power Cables Not Subject to the EQ Requirements in 10 CFR 50.49
- Spent Fuel Pool Leakage and Clogged Tell-Tale Drains (Not discussed in RIS 2011-05)

b. Findings and Observations

The inspectors identified three observations that, if identified in the PEO, would be characterized as performance deficiencies and processed in accordance with NRC Inspection Manual Chapter 0612, "Power Reactor Inspection Reports." These observations are presented in (1), (2), and (3) below. Additionally, the inspectors identified five commitment items with pending actions presented in (4), (5), (6), (7), and (8) below. These eight observations are subject to a follow-up inspection in accordance with NRC inspection procedure IP 71003 to provide reasonable assurance that the license renewal commitments are met.

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



The inspectors interviewed the responsible plant personnel regarding the program documents and implementing procedures for the buried piping program and noted that for the representative sample category of copper-nickel buried piping, the licensee had yet to perform the piping excavation and visual examinations described in the Commitment. Additionally, the inspectors noted that the licensee's UFSAR did not adequately reflect the 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. These observations were captured in the licensee's CAP under CR 435918 and CR 435920.

At the time of this inspection, this commitment item had not been completed and the licensee needed to take necessary actions to address CR 435918 and CR 435920. Therefore, Commitment Item 1 will require further NRC inspection to ensure timely and technically acceptable completion.

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

The inspectors reviewed a 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. 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.

At the time of this inspection, this commitment item had not been completed and the licensee needed to take additional actions to address the inspectors' observation. Therefore, Commitment Item 19 will require further NRC inspection to ensure timely and technically acceptable completion.

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

The inspectors 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 states 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 tiered construction. Therefore, procedure 0-MCM-1207-01 would not have provided adequate instructions during the PEO to inspect the manhole in accordance with the Commitment. The licensee initiated CR 434167 to address the inspectors' observation.

Additionally, the inspectors determined that the electrical cables feeding the "C" RSST had been replaced in 2009 (after the renewed operating license was issued) and rerouted through the Ductline Sump Manhole No. 2. The inspectors reviewed documentation of Design Change 08-029, "RSST "C" 34.5 kV Feeder Cable Replacement/ Surry Power Station/ Units 1 & 2" and observed that in accordance with procedure STD-GN-0001, "Instructions for Design Change Package (DCP) Preparation," Rev 43, Attachment 5, "Programs Review Checklist," this design change was considered for license renewal applicability. However the licensee incorrectly concluded that the new cables did not meet the inspection criteria identified within the aging management program and therefore the new cables were not in the scope of the license renewal program. The inspectors determined that the 'C' RSST cables were within the scope of license renewal and the manhole should have been periodically inspected for water collection and cable submergence.

As corrective action, the licensee initiated CR 435296 and searched through other design changes to identify the extent of condition. The licensee found one other Design Change 05-021, "34.5 kV Switchyard Modifications/Surry/Units 1 & 2," which was also initiated after the renewed operating license was issued, that should have been in license renewal scope for SBO.

At the time of this inspection, this commitment item had not been completed and the licensee needed to take additional actions in response to CR 434167 to either modify procedure 0-MCM-1207-01 or establish a new procedure to conduct periodic visual inspections of Ductline Sump Manhole No. 2 to meet Commitment Item 27. Therefore, Commitment Item 27 is subject to further NRC inspection to ensure timely and technically acceptable completion.

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

The licensee determined 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 is based, have been completed. These issues are currently being monitored through the licensee's CAP as LA000419. The licensee has listed this Commitment Item as open pending the completion of inspections and evaluations for all infrequently accessed areas that fall under this program scope.

At the time of this inspection, this commitment item had not been completed and the licensee needed to take necessary actions to complete Commitment Item 9. Therefore, Commitment Item 9 is subject to further NRC inspection to ensure timely and technically acceptable completion.

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

The inspectors interviewed the responsible plant personnel regarding this program and identified that evaluations of the one-time tank inspections, that will form the basis for any additional needed inspections, had not been completed. The requirement to complete these evaluations was being tracked by the licensee's corrective action problem as LA000420.

The licensee has listed this Commitment Item as open pending the completion of the above mentioned inspection evaluations. Therefore, Commitment Item 10 is subject to further NRC inspection to ensure timely and technically acceptable completion.

(6) Observation for Commitment Item 14 – Follow Industry Activities Related to RV Internals Issues Such as Void Swelling, Thermal and Neutron Embrittlement, etc. Evaluate Industry Recommendations. Inspect Accordingly.

In a response to a Request for Additional Information (RAI) for the LRA, 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 issues.

The inspectors 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 prove Commitment Item 14 was met in its entirety.

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.

Further discussions between the licensee and NRC are in progress on this Commitment Item to resolve the issue of the Surry Unit 2 CRGT inspections. Therefore, Commitment Item 14 is subject to further NRC inspection to ensure timely and technically acceptable completion.

(7) Observation for Commitment Item 15 – Implement Changes into Procedures to Assure Consistent Inspection of Components for Aging Effects During Work Activities

As part of the licensee actions to meet Commitment Item 15, 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 that have been identified as requiring aging management, 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 CAP. The aging effects “as-found” condition form was not conducted for the structures credited by the WCP for aging management. The structures had specific inspection procedures initiated through the WCP at specific intervals.

These actions were still being evaluated by the licensee for their effectiveness in assuring consistent inspection of components for aging effects during work activities. Therefore, Commitment Item 15 is subject to further NRC inspection to ensure timely and technically acceptable completion.

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

As part of Commitment 19, 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 that “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. Any anomalies resulting from the inspections will be dispositioned by Engineering and will consider the cable environment including the potential for moisture in the areas of the anomalies. Occurrence of an anomaly that is adverse to quality will be entered into the Corrective Action System. The corrective action process provides reasonable assurance that deficiencies adverse to quality are either promptly corrected or are evaluated to be acceptable. Although age-related degradation is not expected for power, instrumentation, and control cables and connectors in their normal environments, visual inspections provide reasonable assurance that the intended functions will be maintained.”

The inspectors identified that the inspections of nuclear instrumentation (NI) discussed in this Commitment Item have 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. 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 this goal. At the time of this 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. The test frequency of the cable system is determined by the applicant based on engineering evaluation, but the test frequency is at least once every 10 years. The first test is to be completed prior to the period of extended operation."

The licensee had initiated several CRs to track the completion of this work including CRs 399850, 399851, and during this inspection CR 434485. These tests need to be performed for the first time before May 25, 2012 for Unit 1 and before January 29, 2013 for Unit 2 when each unit enters the period of extended operation. This portion of Commitment 19 will require further NRC inspection to ensure timely and technically acceptable completion.

c. Overall Conclusions

The inspectors determined that, in general, the licensee had completed, or was on track to complete, the necessary tasks to meet the license renewal commitments, license conditions, and regulatory requirements associated with the issuance of the renewed operating license at the Surry Power Station. Some commitments had pending actions remaining, for which task items existed in the corrective action program to track their completion. Within these pending actions, the inspectors identified eight observations that are subject to further NRC inspection per IP 71003.

4OA6 Management Meetings

Exit Meeting Summary

On 07/29/2011, the inspectors presented the inspection results to Mr. Gerald T. Bischof, Site Vice President Surry Power Station, and other members of the licensee staff. The licensee acknowledged the issues presented. The inspectors confirmed that none of the potential report input discussed was considered proprietary. Proprietary material received during the inspection was returned to the licensee.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee

J. Price, Director Site Engineering  
J. Rosenberger, Engineering Programs Manager  
B. Garber, Licensing Supervisor  
J. Warren, Engineering Programs Supervisor  
P. Torres-Jimenez, Aging Management Activities Coordinator  
B. Rodill, License Renewal Lead  
E. Turko, Supervisor – ISI/NDE

### LIST OF REPORT ITEMS

#### Opened

None

#### Closed

None

#### Discussed

None

## LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but rather, that selected sections of portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance or endorsement of the document or any part of it.

### Commitment Item 1, 7, 8, 9, 10, 11, 18

#### Procedures

0-ECM-2501-02, Cathodic Protection for Service Water Piping, Rev. 6  
 0-EPM-2308-01, Inspection of Emergency Diesel Generator Fuel Oil Piping Cathodic Protection, Rev. 1  
 0-MCM-1935-02, Cleaning and Inspection of Fuel Oil Tanks, Rev. 2  
 0-NSP-BS-004, Inspection of Swinging Safety-Related Special Purpose Fire Doors, Rev. 4  
 0-NSP-BS-005, Monitoring of Structures, Rev. 1  
 0-OSP-FP-006, Monthly Fire Door Inspection, Rev. 16  
 0-OSP-FP-010, Daily Fire Door Inspection, Rev. 4  
 0-STP-70.7, Annual Intake Canal Liner Visual Inspection/Acceptance Test, Rev. 3  
 C-HP-1061.330, Catch Containments: Use and Control, Rev. 5  
 CM-AA-CTG-10, Coating Program, Rev. 1  
 CM-AA-CTG-101, Coating Service Level I Application, Rev. 3  
 CM-AA-CTG-104, Condition Assessment of Internally Coated/Lined Tanks, Components, and Pipes Subject to Immersion Service, Rev. 0  
 ER-AA-AMP-1005, Tracking and Trending of Inspection Results for License Renewal Systems, Structures, and Components, Rev. 1  
 ER-AA-AMP-101, Implementation of Activities Performed by License Renewal Aging Management Coordinators, Rev. 2  
 ER-AA-BPM-10, Underground Piping and Tank Integrity Program Description, Rev. 2  
 ER-AA-BPM-101, Underground Piping and Tank Integrity Program, Rev. 2  
 ER-AA-SYS-1002, System Engineering Walkdowns, Rev. 3  
 ET-CEP-04-0019, Assessment of External Condition for Buried Piping at Surry and North Anna, Rev. 0  
 ET-MAT-04-0001, Tape Wrap Application for Buried Pipe, Rev. 2  
 ET-S-04-0019, Repair of Degraded Shaft on 02-CH-P-1C, Rev. 1  
 GMP-031, Emergency Service Water (ESW) Pump House Stop Log Installation and Removal, Rev. 3  
 NPS-PROC 007, Low Frequency Electromagnetic Technique, Rev. 0  
 RP-AA-502, Groundwater Protection Program, Rev. 3  
 RP-SU-101-1000, Health Physics Operations: Department Standards, Rev. 1  
 STD-GN-0001, Instructions for DCP Preparation, Rev. 43

#### Corrective Actions

CA205262, Buried Piping and Tank Programs for License Renewal  
 CR425079, Infrequently accessed areas for license renewal  
 CR434317, Residue on wall of 2-CN-TK-1  
 LA000417, Develop inspection activities for representative samples of buried piping and valves  
 LA000421, Evaluate industry activities on small-bore piping failure mechanisms for changes to inspection activities

LA000556, Develop inspection criteria for Non-ASME Section XI comp supports and doors  
 LA000593, Develop procedural guidance to detect aging effects during walkdowns  
 S-2003-2444-R7, Develop inspection criteria for non-ASME Section XI component supports and doors as part of General Condition Monitoring  
 SAA008107, Evaluate the effectiveness of the Work Management process to manage elastomers  
 SAA010817, Track LR changes to GMP-E-131 and GMP-E-132

#### Drawings

11448-FB-3C, Yard Water and Fire Protection Lines Surry Power Station – Unit 1, Rev. 10  
 11448-FC-12A, Misc. Foundations SH1  
 11448-FC-12B, Misc. Foundations SH-2 110,000 Gal. Cond. Storage Tank.  
 11448-LRM-071A, Circulating and Service Water System Surry Power Station Unit 1 Virginia Power Sheet 3 of 4, Rev. 12  
 11448-LRM-071A, Circulating and Service Water System Surry Power Station Unit 1 Virginia Power Sheet 2 of 4, Rev. 15  
 11448-LRM-071B, Circulating and Service Water System Surry Power Station Unit 1 Virginia Power Sheet 2 of 2, Rev. 4  
 11448-LRM-071D, Circulating and Service Water System Surry Power Station Unit 1 Virginia Power Sheet 1 of 3, Rev. 8  
 11448-LRM-071D, Circulating and Service Water System Surry Power Station Unit 1 Virginia Power Sheet 2 of 2, Rev. 6  
 11448-LRM-088A Sh. 1, Chemical & Volume Control System Surry Power Station Unit 1 Virginia Power, Rev. 7  
 11448-LRM-088A Sh. 2, Chemical & Volume Control System Surry Power Station Unit 1 Virginia Power, Rev. 1  
 11548-LRM-088A Sh. 2, Chemical & Volume Control System Surry Power Station Unit 2 Virginia Power, Rev. 7  
 11548-LRM-088B Sh. 1, Chemical & Volume Control System Surry Power Station Unit 2 Virginia Power, Rev. 4

#### Other Documents

CE-0087, Guideline for Monitoring of Structures Surry Power Station Civil Engineering, Rev. 4  
 DO-103-1208, In-Service Internal Tank Floor Inspection Report Tank 01-CN-TK-1, December 2008  
 Engineering Report – Tank-0-BF-TK-1, February 22, 2007  
 Engineering Report – Tank-1-EE-TK-3, February 21, 2007  
 Engineering Report – Tank-1-FP-TK-4, February 22, 2007  
 Engineering Report – Tank-1-SW-TK-1, February 23, 2007  
 ET-CCE-10-0001, NAPS 2 Refueling Water Storage Tank Inspection – Bottom Thickness Criteria, Rev. 0  
 ET-CEP-08-0001, License Renewal Inspections of Small-Bore Piping, Rev. 0  
 ETE-SU-2010-001, Documentation of One-Time Inspection of IFAAs in Support of License Renewal, Rev. 1  
 ETE-SU-2010-0022, Evaluation of Inspector Qualifications for License Renewal Inspection IAW Commitment 21, Rev. 0  
 ETE-SU-2011-0023, Work Control Process Audit for License Renewal, Rev. 0  
 ETE-SU-2011-0024, License Renewal Inspections for RWST and CAT  
 ETE-SU-2011-0056, Summary of Buried Piping Inspections for Surry License Renewal Commitment Number 1, Rev. 0



ETE-SU-2011-0074, NUREG-1801 (Generic Aging Lessons Learned Report), Rev. 2, Gap Analysis Results for Surry Power Station, Rev. 0  
 ET-S-07-0071, Condition Assessment of Plant Structures (Second Five-Year Inspection Interval), Rev. 0  
 ET-S-07-0122, the License Renewal/FAC Excavation Buried Piping Evaluation, Rev. 0  
 ET-S-08-0119, Evaluation of Buried Piping Inspections, Rev. 1  
 ET-S-09-0153, Evaluation of Buried Piping Inspection for Emergency Service Water Piping, Rev. 0  
 LR-1411, Primary Process Systems Surry Power Station  
 LR-1707/LR-2707, Buried Piping and Valve Inspection Activities Surry and North Anna Power Stations, Rev. 8  
 LR-1714/LR-2714, Civil Engineering Structural Inspection Surry and North Anna Power Stations  
 LR-1732/LR-2732, Inservice Inspection Program: Component and Component Support Inspections Surry and North Anna Power Stations, Rev. 7  
 LR-1738/LR-2738, Steam Generator Inspections Surry and North Anna Power Stations, Rev. 6  
 LR-1756/LR-2756, Tank Inspection Activities Surry and North Anna Power Stations, Rev. 6  
 LR-1766/LR-2766, General Condition Monitoring Activities Surry and North Anna Power Stations, Rev. 5  
 T-10022-LF, Low Frequency Electromagnetic Technique Inspection Report of the Unit #2 Refueling Water Storage Tank (Mark #2-QS-TK-1) at Dominion North Anna Nuclear Generating Station in Mineral, VA by TESTEX, INC

Commitment Item 2, 3, 12, 14, 20, 24, 25

Procedures

ER-AA-2, Materials Degradation Management, Rev. 0  
 ER-AA-MAT-10, Reactor Coolant System Materials Degradation Management Program, Rev. 4  
 ER-AA-MAT-11, Alloy 600 Management Plan, Rev. 8  
 ER-AA-NDE-PT-300, Dominion ASME Section XI Liquid Penetrant Procedure, Rev. 2  
 ER-AA-RII-10, Fleet Reactor Internals Inspection Program Description, Rev. 0  
 ER-AA-RII-101, Fleet Reactor Internals Inspection Program, Rev. 0  
 ER-SU-AUG-101, Surry Augmented Inspection Program, Rev. 5  
 WDI-STD-088.2, Underwater Remote Visual Examination of Reactor Vessel Internals, Rev. 0

Calculations

0-NSP-FC-001, Spent Fuel Pool Leakage Evaluation, Rev. 2

Corrective Action Documents

CR434472, Procedure Enhancement for Cycle/Transient Log Review Procedure, dated 7/15/2011  
 CR435685, Condition of Unit 2 Control Rod Guide Cards, dated 7/26/2011

Drawings

11448-WMKS-1103A7, Inservice Inspection Isometric RC Sys: Pressurizer Surge Line, Surry Power Station – Unit 1, Rev. 3  
 11548-WMKS-RC-9, Inservice Inspection Isometric RC Sys: Pressurizer Surge Line, Surry Power Station – Unit 2, Rev. 1

Other Documents

- 01-685, Virginia Electric and Power Company (Dominion) Surry and North Anna Power Stations Units 1 and 2 Request for Additional Information License Renewal Applications, dated January 4, 2002
- 01-686, Virginia Electric and Power Company (Dominion) Surry and North Anna Power Stations Units 1 and 2 Request for Additional Information License Renewal Applications, dated January 16, 2002
- 02-332, Virginia Electric and Power Company (Dominion) Surry and North Anna Power Stations Units 1 and 2 Request for Additional Information License Renewal Applications, dated June 13, 2002
- 02-360, Virginia Electric and Power Company (Dominion) Surry and North Anna Power Stations Units 1 and 2 License Renewal – Draft SER Response to Open Items and Confirmatory Actions, dated July 25, 2002
- 02-360A, Virginia Electric and Power Company (Dominion) Surry and North Anna Power Stations Units 1 and 2 License Renewal – Comments on Draft SER, dated July 26, 2002
- 02-754, Virginia Electric and Power Company (Dominion) Surry Power Station Units 1 and 2 North Anna Power Station Units 1 and 2 Listing of License Renewal Commitments, dated December 11, 2002
- 1-OSP-RC-001, Reactor Coolant System Cycle/Transient Log Review, Rev. 4
- 2-OSP-RC-001, Reactor Coolant System Cycle/Transient Log Review, Rev. 4
- Dominion Application for Renewed Operating Licenses, Surry Power Station Units 1 and 2
- ETE-SU-2011-074, NUREG-1801 (Generic Aging Lessons Learned Report), Rev. 2, Gap Analysis Results for Surry Power Station, Rev. 0
- ET-S-10-0067, Comparison of Surry Reactor Internals Program: License Renewal Documents vs. MRP-227, Rev. 0
- LR-1736/LR-2736, Inservice Inspection Program – Reactor Vessel, Surry and North Anna Power Station, Rev. 6
- LR-1752/LR-2752, Reactor Vessel Internals Inspection, Surry and North Anna Power Station, Rev. 4
- LR-1760/2760, Technical Report: Transient Cycle Counting, Surry and North Anna Power Stations, Rev. 7
- NDE-PT-701, Dominion Visible Solvent Removable Liquid Penetrant Examination Procedure, Rev. 6
- NDE-UT-802, Dominion Ultrasonic Examination of Ferritic Piping Welds, Rev. 0
- OP-ETC-09.09.00.1, ECT of Flux Thimble Tubes, Rev. 1
- PT-07-012, Liquid Penetrant Examination Report (12-RC-10/1-08), dated 11/07/2007
- PT-08-007, Liquid Penetrant Examination Report (12-RC-310/1-08), dated 05/02/08
- S-2003-2444-R20, Plant Issue Resolution, dated 05/06/2011
- SPS UFSAR, Chapter 18, Programs and Activities That Manage the Effects of Aging, Rev. 42
- SPS-UCR-2010-018, Surry Change Request, dated 9/10/2010
- SPS-UCR-2011-011, Surry Change Request, dated 5/2/2011
- SPS-UCR-2011-021, Surry Change Request, dated 6/23/2011
- Surry Unit 1 VT-3 Visual Examination Report – Reactor Vessel Interior (Core Barrel Hold-Down Spring), dated 4-30-06
- Surry Unit 2 VT-3 Visual Examination Report – Reactor Vessel Interior (Core Barrel Hold-Down Spring), dated 3/20/06
- UT-07-091, UT Calibration/Examination Report (12-RC-10/1-08), dated 11/07/2007
- UT-08-054, UT Calibration/Examination Report (12-RC-310/1-08), dated 05/05/08

Commitment Item 4, 13, 16, 17, 23, 28, 29Procedures

0-CSP-PL-001, Rev. 5, "Subsurface Drain Chemistry"

0-NSP-BS-005, Rev. 1 Monitoring Of Structures

RE 442517 1825 Day Frequency of PT Monitoring of Structures

Corrective Action Documents

CA173424, CA to Engineering to determine source of water and initiate required actions, dated 7/9/2010

CA176752- Pages missing from technical report CE-0087, dated 8/17/2010

CA199814 NRC Phase 1 License Renewal Inspection for Unit 2- Concrete Aging Management

Other Documents

Application for Renewed Operating Licenses Surry Power Station Units 1 and 2

ET NPD-LR-02-2002, Rev. 0, Modifications to Technical Reports CE-0087 and CE-0089

Surry and North Anna Power Stations, Units 1 and 2 dated 10-25-2005

ET S-02-0119, Rev. 0, Condition Assessment of Plant Structures, (First Five-Year Inspection Interval) Surry Power Station Units 1 and 2, dated 6-25-03

ETE-SU-2011-0035 dated 6/03/2011

ET-S-07-0071, Rev. 0, Condition Assessment of Plant Structures (Second Five-Year Inspection Interval) dated 6/26/2008

OE 26709, Concrete Corrosion Control Project dated 05/06/2008

OE 30767, Surface Cracking of Dry Fuel Storage Module Structures dated 3-18-2010

Plant Issue Resolution S-2003-2444-R4

Plant Issue Resolution S-2003-2444-R13

Plant Issue Resolution S-2003-2444-R16

Plant Issue Resolution S-2003-2444-R17

Plant Issue Resolution S-2003-2444-R28

SAA003429 Licensing Renewal / Aging Management Program Implementation, dated 1/23/2009

SAR000590: Licensing Renewal / Aging Management Program Implementation, dated 7/21/2009

SPS-UCR-2011-010, SAR Change Request dated 6/23/2011

Surry Power Station Updated Final Safety Analysis Report Revision 41.02 Updated on line 11/30/09

Technical Report No. CE-0087 - Rev. 4 Guideline for Monitoring of Structures Surry Power Station dated 5-31-11

Technical Report: LR-1714/LR-2714, License Renewal Project Aging Management Activities Civil Engineering Structural Inspection Surry and North Anna Power Stations, dated 6/10/10

Commitment Item 5, 15, 21, 22Procedures

Procedure ER-AA-AMP-1005, Tracking and Trending of Inspection Results for License Renewal Systems, Structures and Components, Rev. 1

Procedure NSP-BS-005, Monitoring of Structures, Rev. 1

Procedure WM-AA-100, Work Management, Rev. 15

Corrective Action Documents

CA 158692 – implementation of corrective actions identified in CR365984  
 CR 365984 – Corrective action request for conditions found in LR audit

Other Documents

ETE-SU-2011, Rev. 0 – Engineering Evaluation of LR Audit  
 Engineering Evaluation ETE-SU-2010-0022 – Evaluation of Inspector Qualifications  
 Plant Issue Resolution S-2003-2444-R15, Dated 10/2003  
 UFSAR change request FS-2004-009, dated 05/27/2004  
 SAR Change Request SPS-UCR-2011-022, UFSAR changes to Table 18-1  
 Technical Report LR-1768/LR-2768, Dated 2/4/11  
 Preventative WO #53M30808632, PM 4yr Inspection, Dated 5/12/11  
 Work Request 2298, Dated 5/31/11  
 SAR Change Request SPS-UCR-2011-011, UFSAR changes to 3.3.19 for commitment #21

Commitment Item 6, 19, 26, 27, 30Procedures

ET-CEP-05-0020, License Renewal Fuse Holder Walkdown – Surry Power Station  
 Commitment 26, Revision 0  
 STD-GN-0001, Instructions for DCP Preparation, Revision 43  
 WM-AA-100, Work Control

Corrective Action Documents

CR 399850  
 CR 399851  
 CR 427521  
 CR 434485  
 CR 434832  
 CR 435296, DCP-05-021 for 34.5kV Switchyard did not recognize impact of License  
 Renewal  
 CR 435764  
 CR 435801, Enhancements required to WM-AA-100 for LR requirements  
 CR 435945  
 CR418791, Water in pit, cables appear to be damaged  
 CR421104, Ductline Sump Manhole #2 was not periodically inspected for water  
 accumulation  
 CR434167, Proposed corrective actions may be ineffective to obtain required LR inspection

Work Orders

WO 38027719101, (P) Troubleshoot/Repair Pumps  
 WO 38028074101, Repair Level Switch  
 WO 38029006301, RPR/Replace Discharge Piping & Pumps as Req.  
 WO 38029067101, Replace Pump's Discharge Clamp & Gasket  
 WO 38038043601, Repair Level Switch  
 WO 38038043801, Replace Pump  
 WO 38038600701, Check/Repair/Replace Level Switch  
 WO 38043444201, Repair/Replace Level Switch & Pump  
 WO 38079905601, PM: Replace Sump Pump  
 WO 38079905602, Disconnect/Connect Pump  
 WO 38079905701, PM: Replace Sump Pump

WO 38079905702, Disconnect/Connect Pump  
 WO 38102181188, Remove and reinstall fire line  
 WO 38102181253, Remove and reinstall fire line  
 WO 38102201222, Inspect check valve  
 WO 38102259297, PM: inspect deluge/alarm valves  
 WO 38102259467, PM: inspect deluge/alarm valves  
 WO 38102259477, PM: inspect deluge/alarm valves  
 WO 38102259963, PM: inspect deluge/alarm valves  
 WO 38102260123, PM: inspect deluge/alarm valves  
 WO 38102403606, Remove, test, rpr/replace relief valve  
 WO 38102405333, Remove, test, rpr/replace relief valve  
 WO 38102577508, PM: Disass./clean/inspect strainer  
 WO 38102577965, Sealing and Dewatering of the AAC Ductline Conduits  
 WO 38102578314 PM: Disass./clean/inspect strainer  
 WO 38102743101, Remove fire protection piping/interferences  
 WO 38102743102, Remove fire protection piping/interferences removed  
 WO 38102860871, Remove blockage  
 WO 38102865632, 1-PL-P-5A will not turn off in Auto (Unit 1 Intake  
 WO 38102866025, Replace damaged sprinkler head downstream of 01-FP-246-valve  
 WO 38102897218, PM: inspect CARDOX tank  
 WO 38102953540, 1-FP-RV-921 opened during 2-EPT-0902-01  
 WO 38102990793, Overhaul compressor  
 WO 38102992535, Replace threaded fire protection valve  
 WO 38103030549  
 WO 38103030580, Replace check valve

#### Other Documents

0-MCM-1207-01, Pumping of Security and Electrical Cable Vaults, Revision 5  
 CM-AA-FPA-100, Fire protection/appendix R (Fire Safe Shutdown) Program, Revision 4  
 DCP 08-029, RSST "C" 34.5kV Feeder Cable Replacement/Surry Power Station/Units 1&2  
 Design Change 05-021, 34.5 kV Switchyard Modifications / Surry/ Units 1 & 2  
 ET-CEP-04-0021, Results of first non-EQ cable inspection  
 ETE-SU-2011-0045, Resolution of GALL License Renewal requirements for neutron  
 absorbing material in spent fuel storage racks, Revision 0  
 ETE-SU-2011-0059, Justification for Surry's Compliance of License Renewal Commitment #  
 30.  
 Generic Aging Lessons Learned (NUREG-1801), Revision 1  
 Guidance and Reference Document ER-SU-5909, SPS Program to Inspect Non-EQ  
 Electrical Cables, Revision 0  
 Licensee letter to NRC serial number 02-297 dated July 11, 2002  
 Licensee letter to NRC serial number 02-360 dated July 25, 2002  
 NUREG-1766, "Safety Evaluation Report (SER) Related to the License Renewal of North  
 Anna Power Station Units 1 and 2, and Surry Power Station, Units 1 and 2"  
 RE 96249  
 RTE P-SURR-315209  
 S-2003-2444-R27, Plant Issue Resolution for Commitment 27  
 Surry UFSAR, Section 18.1.4 "Non-Environmental Qualification (EQ) Cable Monitoring"  
 Surry UFSAR, Section 18.1.4 "Non-Environmental Qualification (EQ) Cable Monitoring"  
 Surry UFSAR, Section 18.1.4 "Non-Environmental Qualification (EQ) Cable Monitoring"  
 Technical Report LR-1772/LR-2772, "License Renewal Aging Management Activities: Non-  
 EQ Cable Monitoring Surry and North Anna Power Stations", Revision 6

## LIST OF ACRONYMS USED

ACI	American Concrete Institute
ADAMS	Agency wide Document Access Management System
AMP	Aging Management Program
ASME	American Society of Mechanical Engineers
BPVC	Boiler and Pressure Vessel Code
CA	Corrective Action
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Correction Requirement
DCP	Design Change Package
EC	Engineering Change
EPRI	Electric Power Research Institute
EQ	Environmental Qualification <u>or</u> Environmentally Qualified
ESW	Emergency Service Water
ETE	Engineering Technical Evaluation
FAC	Flow-Accelerated Corrosion
GALL	NUREG-1801 "Generic Aging Lessons Learned"
GARD	Dominion Nuclear Fleet Guidance and Reference Document
HVAC	Heating, ventilation and air conditioning
IP	Inspection Procedure
IR	Inspection Report
ISI	Inservice Inspection
LR	License Renewal
LRA	License Renewal Application
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
NRC	U.S. Nuclear Regulatory Commission
NUREG	NRC Technical Report
PARS	Publicly Available Records
PEO	Period of Extended Operation
PTSS	Periodic Test Scheduling System
PZR	Pressurizer
QMT	Quality Maintenance Team
RAI	Request for Additional Information
RIS	Regulatory Information Summary
RO	Refueling Outage
RPV	Reactor Pressure Vessel
RSST	Reserve Station Service Transformer
SAR	Safety Analysis Report
SBO	Station Black Out
SER	Safety Evaluation Report
SI	Safety Injection
SSC	Structures, Systems, and Component
TLAA	Time Limited Aging Analysis

UFSAR	Updated Final Safety Analysis Report
UPTI	Underground Piping and Tanks Initiative
UT	Ultrasonic Testing
VT	Visual Test or Inspection
WCP	Work Control Process
WO	Work Order
WR	Work Request