



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PA 19406-2713

August 19, 2014

Mr. George H. Gellrich, Vice President
Calvert Cliffs Nuclear Power Plant, LLC
Exelon Generation Company, LLC
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657-4702

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT UNIT ONE – NRC LICENSE
RENEWAL COMMITMENTS INSPECTION REPORT 05000317/2014009

Dear Mr. Gellrich:

On July 10, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Calvert Cliffs Nuclear Power Plant, Unit 1. The enclosed inspection report documents the inspection results, which were discussed on July 10, 2014, with you and members of your staff.

The inspection examined the actions taken to complete commitments made as part of your application for a renewed license. The inspectors reviewed selected aging management programs, observed activities, and interviewed station personnel to determine if the selected commitments had been fulfilled.

No NRC-identified findings or self-revealing findings were identified during this inspection. The NRC did not identify any instances of incomplete commitments with respect to timeliness or adequacy. Based on the results of this inspection, the NRC has concluded the commitments are being tracked to completion and there is reasonable assurance aging will be effectively managed during the period of extended operation.

In accordance with Title 10 of the *Code of Federal Regulations* (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 component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Mel Gray, Chief
Engineering Branch 1
Division of Reactor Safety

Docket Nos. 50-317
License Nos. DPR-53

Enclosure: Inspection Report 05000317/2014009
w/Attachment: Supplemental Information

cc w/encl: via ListServ

Mr. George H. Gellrich, Vice President
Calvert Cliffs Nuclear Power Plant, LLC
Exelon Generation Company, LLC
1650 Calvert Cliffs Parkway
Lusby, Maryland 20657-4702

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT UNIT ONE – NRC LICENSE
RENEWAL COMMITMENTS INSPECTION REPORT 05000317/2014009

Dear Mr. Gellrich:

On July 10, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Calvert Cliffs Nuclear Power Plant, Unit 1. The enclosed inspection report documents the inspection results, which were discussed on July 10, 2014, with you and members of your staff.

The inspection examined the actions taken to complete the commitments made as part of your application for a renewed license. The inspectors reviewed selected aging management programs, observed activities, and interviewed station personnel to determine if the selected commitments had been fulfilled.

No NRC-identified findings or self-revealing findings were identified during this inspection. The NRC did not identify any instances of incomplete commitments with respect to timeliness or adequacy. Based on the results of this inspection, the NRC has concluded the commitments are being tracked to completion and there is reasonable assurance aging will be effectively managed during the period of extended operation.

In accordance with Title 10 of the *Code of Federal Regulations* (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 component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Mel Gray, Chief
Engineering Branch 1
Division of Reactor Safety

Docket Nos. 50-317
License Nos. DPR-53
Enclosure: Inspection Report 05000317/2014009
w/Attachment: Supplemental Information
cc w/encl: via ListServ

Distribution via email (Next Page)

DOCUMENT NAME: G:\DRS\Engineering Branch 1\-- Modes\20140818 05000317_2014009 71003 Calvert Inspection Report.docx **ADAMS Accession No.** ML14231A529

<input checked="" type="checkbox"/> SUNSI Review		<input checked="" type="checkbox"/> Non-Sensitive	<input checked="" type="checkbox"/> Publicly Available	
OFFICE	RI/DRS	RI/DRP	RI/DRS	
NAME	MModes/MM	DSchroeder/DLS	MGray/MKG	
DATE	08/18/2014	08/18/2014	08/19/2014	

OFFICIAL RECORD COPY

G. Gellrich

2

Distribution w/encl via e-mail

W. Dean, RA

D. Lew, DRA

H. Nieh, DRP

M. Scott, DRP

J. Trapp, DRS

P. Krohn, DRS

D. Schroeder, DRP

A. Rosebrook, DRP

R. Clagg, DRP, SRI

E. Torres, DRP, RI

S. Chaudhary, DRS

M. Gray, DRS

C. Fragman, DRP, AA

A. Bowers, RI, OEDO

RidsNrrPMCalvertCliffs
Resource

RidsNrrDorlLp11-1

Resource

ROPreports Resource

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos. 50-317

License Nos. DPR-53

Report Nos. 05000317/2014009

Licensee: Calvert Cliffs Nuclear Power Plant, LLC
Exelon Generation Company, LLC

Facility: Calvert Cliffs Nuclear Power Plant, Unit 1

Location: Lusby, MD

Dates: November 6-8, 2013; May 19-23, 2014; June 2-6 and July 7-10, 2014

Inspectors: M. Modes, Sr. Reactor Inspector, DRS
G. Meyer, Sr. Reactor Inspector, DRS
M. Patel, Reactor Inspector, DRS
E. Andrews, Reactor Inspector, DRP
S. Chaudhary, Reactor Inspector, DRS

Approved by: Mel Gray, Chief
Engineering Branch 1
Division of Reactor Safety

SUMMARY

IR 05000317/2014009, November 6-8, 2013; May 19-23, 2014; June 2-6 and July 7-10, 2014, Calvert Cliffs Nuclear Power Plant Unit 1, License Renewal Commitments Inspection.

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

The inspection examined the actions taken to complete commitments Exelon made as part of an application for a renewed license. The inspectors reviewed selected aging management programs, observed activities, and interviewed station personnel to determine if the selected commitment had been fulfilled. The NRC did not identify any instances of incomplete commitments with respect to timeliness or adequacy. Based on the results of this inspection, the NRC has concluded the commitments are being tracked to completion and there is reasonable assurance aging will be effectively managed during the extended period of operation.

REPORT DETAILS

4. OTHER ACTIVITIES

4OA5 Other Activities

.1 Post-Approval Site Inspection For License Renewal – IP71003

The purpose of this team inspection was to verify the license conditions added as part of the renewed operating license, regulatory commitments, and selected aging management programs are implemented and/or completed in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 54, "Requirements for the Renewal of Operating Licenses for Nuclear Power Plants." This inspection also verified the updated final safety analysis report (UFSAR) included any newly identified systems, structures, and components that should have been within the scope of the license renewal program and subject to an aging management review or time limited aging analysis pursuant to 10 CFR 54.37(b). The inspectors verified that the descriptions of the aging management programs were contained in the UFSAR and that the descriptions of the programs were consistent with the programs implemented by the licensee. Lastly this inspection verified the licensee submitted a license amendment request to the U.S. Nuclear Regulatory Commission (NRC) in accordance with 10 CFR 50.90 for changes to a license condition for license renewal; managed changes to the UFSAR supplement in accordance with 10CFR 50.59; and managed changes to regulatory commitments in accordance with Nuclear Energy Institute (NEI) 99-04, "Guidelines for Managing NRC Commitment Changes" as endorsed by Regulatory Issue Summary (RIS) 2000-017.

The inspection included observations of license renewal commitments which were enhancements to exiting programs already implemented under the current license. The inspection included a review of selected aging management programs supporting the implementation of commitments. For each commitment the inspectors reviewed supporting documents including completed surveillances, conducted interviews, performed visual inspection of structures and components and observed selected activities described in this inspection report to verify the licensee completed the necessary actions to comply with the commitments. When the performance of an existing program was evaluated by the inspectors, the basis for the evaluation was the current licensing basis and the license renewal enhancements were considered separately in the evaluation. For license renewal activities the report documents inspector observations, because the license renewal commitments do not have to be completed until the facility enters the extended period of operation.

Enclosure

Sample Selection Process

The reviewed commitments, license conditions, and enhanced aging management programs were selected based on several attributes including:

- the risk significance of structures, systems, and components associated with the regulatory commitments, using insights gained from sources such as the NRC's "SDP Risk Informed Inspection Notebooks," Revision 2, the extent of previous license renewal audits and inspections;
- the extent to which baseline inspection programs inspect a structure, system or component;
- the amount of time since the renewed license was granted and beginning of the period-of-extended operation;
- the type and maturity of the AMP, for example, programs such as the selective leaching one-time inspection program, or infrequent inspection activities may take priority over long-standing programs such as the Steam Generator Tube Integrity Program, which are routinely inspected under the Reactor oversight Process;
- issues that were addressed in an Atomic Safety Licensing Board hearing or Advisory Committee on Reactor Safeguards committee meeting;
- issues that were extensively reviewed and questioned at the time of the application review;
- whether the licensee updated its aging management programs as a result of recent operating experience, as a result of updates to the NRC Generic Aging Lessons Learned (GALL) Report or other approved guidance

The inspectors selectively verified the licensee implemented the aging management programs, included in the staff's license renewal safety evaluation report, in accordance with Title 10 of *the Code of Federal Regulations* Part 54, "Requirements for the Renewal of Operating Licenses for Nuclear Power Plants." The inspectors verified a selected sample of licensee corrective actions that were the result of license renewal activities.

Commitment Management

During this inspection the inspectors verified that changes, if any, to these commitments were identified and properly reviewed and approved. The inspectors noted the implementation of the license renewal aging management program, "Above Ground Tanks," included a subsidiary commitment to perform a visual inspection of the Sodium Hydroxide Tank, in lieu of an ultrasonic thickness evaluation of the tank bottom. In a letter dated September 12, 2013, Constellation, the prior licensee, informed the NRC the Sodium Hydroxide Tank is no longer used and the visual inspection would be performed as part of the External Surfaces Monitoring Program. The inspectors concluded Constellation was applying the principals of commitment management contained in NEI 99-04 [Revision 0], "Guidelines for Managing NRC Commitment Changes," (ADAMS ML0036800880) when informing the NRC about this change.

Enclosure

License Conditions

The application for a renewed license was submitted by Baltimore Gas and Electric Company (BGE), on April 8, 1998. The inspectors noted that on October 30, 2009, the license for Calvert Cliffs Unit One was transferred to Calvert Cliffs Nuclear Power Plant, LLC and on March 24, 2014, the operating authority under this license was transferred to Exelon Generation Company, LLC. Amendment 305 of the license stipulates that Exelon Generation is authorized to act for Calvert Cliffs Nuclear Power Plant, LLC and has exclusive responsibility and control over the physical possession, operation, and maintenance of the facility. The inspectors reviewed Exelon's compliance with the following conditions of the license:

- 2. (F) At the time of the next scheduled update to the FSAR required pursuant to 10 CFR 50.71(e)(4) following the issuance of this renewed license, Exelon Generation shall update the FSAR to include the FSAR supplement submitted pursuant to 10 CFR 54.21 (d), as amended and supplemented by the program descriptions in Appendix E to the Safety Evaluation Report, NUREG-1705. Until that FSAR update is complete, Exelon Generation may make changes to the programs described in Appendix E without prior Commission approval, provided that the licensee evaluates each such change pursuant to the criteria set forth in 10 CFR 50.59 and otherwise complies with the requirements in that section.

The inspectors reviewed the current UFSAR, and discussed the planned revisions with Exelon staff. The inspectors concluded that Exelon was complying with this condition of the license.

- 2. (G) Any future actions listed in Appendix E to the Safety Evaluation Report, NUREG-1705, shall be included in the FSAR. Exelon Generation shall complete these actions by July 31, 2014, except for the volumetric inspections of the control element drive mechanisms, which must be completed no later than 2029 for Unit 1 (Appendix E, Item 65).

Based on a review of a sample of commitments, the inspectors determined Exelon Generation completed, or appropriately revised, the actions listed in Appendix E to the Safety Evaluation Report, NUREG-1705; except for volumetric inspections of the control element drive mechanisms which will be completed prior to 2029.

The results of the inspectors review of a sample of commitments is described in the following. The specific documents reviewed are listed in the Attachment to this report.

Enclosure

.01 Elastomer Vibration Isolators

a. Inspection Scope

Commitment 2 –“The Seismic Verification Project found the current condition of vibration isolators inspected to be acceptable, except for those that support the Control Room HVAC air handler. Prior to the Seismic Verification Project walkdown, these supports were identified by the system engineer as requiring replacement, and a modification is planned to replace the elastomer isolators with spring-type isolators. After these isolators are replaced, follow-on inspections will be adequate to manage aging of elastomer vibration isolator component supports for other equipment.”

Calvert Cliffs Nuclear Power Plant (CCNPP) staff implementing the Seismic Verification Project found the current condition of vibration isolators inspected to be acceptable, except for those that support the Control Room HVAC air handler. Prior to the Seismic Verification Project walk down, these supports were identified by the system engineer as requiring replacement, and a modification was planned to replace the elastomer isolators with spring-type isolators. After these isolators were replaced, follow-on inspections were considered to be adequate to manage aging of elastomer vibration isolator component supports for other equipment.

CCNPP staff later determined that use of spring-type isolators was inappropriate and that rigid attachment of the air handlers (without elastomer material) was the proper approach, which was implemented via an engineering modification. The inspectors reviewed the engineering modification package to install the rigid attachments and the implementing work orders, which had been completed in January 2001. The inspectors observed in the field the rigid attachments of the 11 and 12 Control Room HVAC air handling units.

b. Findings

No findings were identified.

.02 Modified Preventative Maintenance Program Tasks

a. Inspection Scope

Commitment 3 - “Some Calvert Cliffs Nuclear Power Plant Preventative Maintenance (PM) Program, MN-1-102, tasks will be modified to look for the effects of specific aging mechanisms. These inspections will explicitly present inspection requirements for discovery of degraded coatings, material loss, or other indications of aging degradation.”

The inspectors reviewed the commitment implementation plan, NRC safety evaluation report, implementation procedures and associated work orders. The inspectors discussed this commitment with applicable plant staff and license renewal personnel.

The inspectors noted the procedures used to complete the relevant PM tasks included monitoring the general corrosion of steel for HVAC systems, including cable raceway supports, HVAC ducting supports and equipment supports. The PM tasks were revised with guidance to look for the effects of specific aging mechanisms and identify degraded coatings, material loss, or other indications of aging degradation.

In addition to reviewing the HVAC system, this commitment also involved monitoring erosion corrosion of carbon steel for the feedwater check valves. The inspectors reviewed completed work orders of inspections and repairs completed inside the body, drain assembly and attached piping for various feedwater check valves for the past six years. The inspectors verified that the required inspections were completed and confirmed that recurring work orders exist to complete future inspections at the required frequency.

b. Findings

No findings were identified.

.03 Corrosion Due to Boric Acid on Pipe Supports

a. Inspection Scope

Commitment 4 – “Program for discovery of corrosion due to potential boric acid leakage for the piping supports associated with the spent fuel pool (SFP) demineralizer and filter.”

The inspectors reviewed documentation, performed a walkdown inspection of the SFP and filter areas, and discussed the status of implementation of the commitment with the CCNPP technical and management personnel. The inspectors determined that CCNPP staff revised Administrative Procedure MN-3-123 to include steps to identify whether boric acid corrosion was present on b SFP and filter piping supports. The inspectors determined CCNPP staff performed initial baseline examinations in two phases. Direct visual examinations were conducted followed by remote visual examinations for the SFP tank, filter, and tank support legs. A floor plug adjacent to the SFP Ion-Exchanger room was removed to perform maintenance, and a pole camera was used to examine the piping supports. CCNPP staff maintained photographs of other parts of the examination for records and future reference.

b. Findings

No findings were identified.

04. General Corrosion Effects on Cranes

a. Inspection Scope

Commitment 6 – “PM Program modified to explicitly present inspection requirements for discovery and management of general corrosion effects in carbon steel parts of the Spent Fuel Inspection Elevator, New Fuel elevator, transfer machine jib crane, SFCHC, PC, ISSGC, and reactor vessel head lift rig, respectively, by performing visual inspections.”

The inspectors reviewed documentation, performed a walkthrough inspection, and discussed the status of implementation of the commitment with CCNPP technical and management personnel. The inspectors determined that CCNPP staff had modified the commitment to include Spent Fuel Cask Handling Crane (SFCHC), Polar Crane (PC), In-take Structure Semi-Gantry Crane (ISSGC), and Reactor Vessel Head Lifting Rig for performing visual examinations for corrosion and its adverse effects, if any.

b. Findings

No findings were identified.

.05 Containment Tendon Surveillance Test

a. Inspection Scope

Commitment 7 - “Procedure STP-M-663-1/2 provides instructions for the Containment Tendon Surveillance. These STPs discover and manage the effects of corrosion on the containment tendons by visual inspection and analysis of the filler grease and for discovery and management of the effects of weathering of grout by visual inspection.”

The inspectors reviewed the commitment implementation plan, NRC safety evaluation report, associated implementation procedures, and calculations for determining factors to be used for the Unit 1 tendon surveillance test after the 2002 tendon replacement and re-stressing. The report for the 35th year tendon surveillance test was also reviewed to determine the current status of the three types of containment tendons (dome, vertical, and hoop) and to ensure a representative sample of each tendon was tested for lift-off force. Visual inspections were completed on each tendon to check for corrosion, damage and the presence of water. Additionally, a chemical analysis of the grease for each of the selected tendons was performed to detect changes in chemical properties.

The inspectors discussed this commitment with applicable plant staff and license renewal personnel. The inspectors verified that the required inspections have been completed and future inspections were scheduled.

b. Findings

No findings were identified.

Enclosure

06. Structure and System Walkdown Program

a. Inspection Scope

Commitment 8 – “The Structure and System Walkdowns Program guidance will be added to assist in functional adequacy determinations and for authority to deviate from scope or schedule. Program will be modified to specify scope and control of periodic structure performance assessments.”

The inspectors reviewed the Structure and System Walkdowns Program guidance documents and determined guidance was added to assist in functional adequacy determinations and for authority to deviate from scope or schedule. The programs were modified to specify scope and control of periodic structure performance assessments. For example, PFR 246 addressed implementation of the Structure and System Walkdowns Program on cooling water system bolting. The inspectors reviewed the aging management basis document and implementing procedure and observed the walkdown being performed by the system engineer on portions of the Unit 1 service water system on February 27, 2014.

The inspectors further reviewed documentation, performed a walkthrough inspection, and discussed the status of implementation of the commitment with the applicant's technical and management personnel. The inspectors determined that in Appendix A to the License Renewal Application (LRA), CCNPP staff identified the structure and system in the station procedure. The inspectors determined Administrative Procedure MN-1-319 (formerly plant engineering guideline PEG-7) was revised to describe the additional items to be included in the walkdown program. This procedure was used for the following fourteen additional structures and systems included in the program.

- component supports (Section 3.1)
- primary containment structure (Section 3.3A)
- turbine building structure (Section 3.3B)
- intake structure (IS) (Section 3.3C)
- miscellaneous tank and valve enclosures (Section 3.3D)
- auxiliary building and safety-related diesel generator building structures (Section 3.3E)
- auxiliary feedwater system (Section 5.1)
- diesel fuel oil system (Section 5.7)
- fire protection (Section 5.10)
- auxiliary building heating and ventilation system (Section 5.11B)
- control room and diesel generator buildings' heating, ventilating and air conditioning systems (Section 5.11C)
- safety injection system (Section 5.15)
- instrument lines (Section 6.4)

b. Findings

No findings were identified.

Enclosure

.07 Baseline Inspection of Containment Structure

a. Inspection Scope

Commitment 9 – “Upcoming Baseline Inspections of Containment Structures will be used to verify that any freeze-thaw damage will not affect intended functions.”

The inspectors reviewed documentation, performed a walkthrough inspection, and discussed the status of implementation of the commitment with the CCNPP technical and management personnel. The inspectors determined that CCNPP staff had implemented Surveillance Test Procedure STP-M-665-1, Rev 00700, for visual examinations and inspection of the containment structure for any evidence of degradation, or any indication of unusual conditions, including degradation due to freeze-thaw cycles, which may affect the intended function of the structure.

To determine and verify the effectiveness of the STP, the inspectors reviewed the results of the last examination. The inspectors noted the records of the examinations were recorded and preserved per the requirements of the Administrative Procedure EN-4-104. The records were detailed, legibly documented, and verified there were not freeze-thaw conditions affecting the containment structure safety functions.

b. Findings

No findings were identified.

.08 Caulking and Sealant Inspection Program

a. Inspection Scope

Commitment 10 – “A new CCNPP Caulking and Sealant Inspection Program will provide requirements and guidance for the identification, inspection frequencies, and acceptance criteria for caulking and sealant used in the Turbine Building to ensure that their condition is maintained at a level that allows them to perform their intended functions. The new program will require a baseline inspection to determine the material condition of the caulking and sealants for the Turbine Building. If unacceptable degradation exists, corrective actions will be taken.”

The inspectors reviewed documentation, performed a walkthrough inspection, and discussed the status of implementation of the commitment with the CCNPP technical and management personnel. The inspector determined that the applicant had implemented a program of periodic inspection and examination of caulking and sealants used/installed. A new Caulking and Sealant program provided identification, inspection frequency, and acceptance criteria for caulks and sealants used in the Turbine Building to assure that their condition was maintained at a level to effectively perform their design function. The program required that a baseline inspection be performed to determine and document the existing material condition, and to assure acceptable condition existed and were maintained.

Enclosure

b. Findings

No findings were identified.

.09 Intake Structure Cavity Inspection

a. Inspection Scope

Commitment 11 – “PM Program (MN-1-102) Repetitive Tasks 10092042; 10092043; 10092044; 10092041009204100920420092039; 2009204; 20092041; 20092042; 20092043; and 20092044 for Intake Structure Cavity Repairs and Cleaning during Refueling Outages tasks will be modified to include specific age-related degradation mechanisms (ARDMs) where they are not presently included and/or additional specified components/subcomponents where they are not presently inspected.”

The inspectors reviewed documentation, and discussed the status of implementation of the commitment with CCNPP technical and management personnel. The inspectors determined that CCNPP staff had modified the maintenance tasks associated with the Preventive Maintenance Program for Intake Structure Cavity Repairs and Cleaning during Refueling Outages program. Individual maintenance tasks were modified to include steps to identify specific age-related degradation mechanisms and describe the specific additional components or subcomponents for inspection.

b. Findings

No findings were identified.

.10 Repetitive Tasks for Inspection of Sluice Gates

a. Inspection Scope

Commitment 12 - The inspectors reviewed documentation, performed a walkthrough inspection, and discussed the status of implementation of the commitment with CCNPP technical and management personnel. The inspectors determined that the repetitive inspection tasks were described in Section 3.1 of Administrative Procedure MN-1-319, Attachment 6 for the intake structure, which included the sluice gates, wire rope and chain assembly. These programs were administratively controlled by a formal review and approval process. The Attachment 3.3C categorized components in four groups to effectively implement the program. A detailed description of requirements and bases was provided for the repetitive inspection tasks for each group.

b. Findings

No findings were identified.

.11 Thermal Embrittlement Control Program

a. Inspection Scope

Commitment 14 – “A new program will be developed to manage the effects of thermal embrittlement by identifying those components that may be susceptible to the effects of thermal embrittlement. The CASS Evaluation Program will: (1) screen components; (2) review operating experience; (3) utilize enhanced VT-1 inspection [a visual examination capable of ½ mil resolution] (for reactor vessel internals [RVI] only); and (4) follow industry programs to evaluate thermal embrittlement and change the program accordingly.”

The inspectors reviewed Constellation Energy Nuclear Group, Station Administrative Procedure, MN-3-317, “Control of the Cast Austenitic Stainless Steel Program”, Revision 00000. This administrative procedure referred to the supporting license renewal document AMBD-0027, “License Renewal Aging Management Basis Document, CASS Evaluation Program, indicating the Cast Austenitic Stainless Steel (CASS) program is a license renewal aging management program.

This program resulted in identification of components for which inspection and evaluation was necessary. Seven components were screened in as potentially susceptible to thermal aging embrittlement. These components were five elbows in the pressurizer surge line, the shutdown cooling nozzle (safe-end hot leg) and the pressurizer surge nozzle (safe-end). These components were being evaluated for flaw tolerance in accordance with part 4 of the commitment.

b. Findings

No findings were identified.

.12 Alloy 600 Program for Reactor Coolant System (RCS) Components

a. Inspection Scope

Commitment 15 – “Alloy 600 Program will be modified to include RCS nozzle thermal sleeves and non-pressure boundary components. Welds and base metals are implicitly included in this program. The Alloy 600 Program will be modified to include all Alloy-600 components, not just those forming the pressure boundary. (Note: Volumetric inspections of the CEDM nozzles will occur no later than 2029 for Unit 1.)”

The inspectors noted in Table I, of AMBD-0041, Revision 0100, the Control Element Drive Mechanism (CEDM) nozzles were specifically included in an aging management review as well as RCS components, welds, and structures. The inspectors determined the Alloy 600 program incorporated the requirements of:

MRP-126, "Materials Reliability Generic Guidance for Alloy 600 Management"
 ASME Code Case N-770-1, with conditions in 10 CFR 50.55a (g)(6)(ii)(G)
 ASME Code Case N-722-1, with conditions in 10 CFR 50.55a (g)(6)(ii)(G)
 NEI-03-08, Rev. 2, "Guideline for the Management of Materials Issues", January 2010

b. Findings

No findings were identified.

.13 Fatigue Analysis for Reactor Components

a. Inspection Scope

Commitment 16 – "A one-time fatigue analysis will be performed for the reactor coolant pumps (RCPs), motor-operated valves (MOVs), and pressurizer RVs to determine if these components are bounded by components and transients currently included in the Fatigue Monitoring Program (FMP). If these components are not bounded they will be added to the FMP. The FMP will also assess the effect of the environment using statistical correlations developed by ANL in NUREG/CR-5704. The modified FMP will use the ANL statistical correlations to calculate an effective environmental factor to account for the reduction in fatigue life due to the reactor water environment. This factor will be applied to fatigue loads where the specified threshold criteria for strain rate and temperature have been exceeded. A factor of 1.5 will be used for evaluation of austenitic stainless steel components."

The fatigue analysis required for the reactor coolant pumps (RCPs), motor-operated valves (MOVs) and pressurizer relief valves (RVs) was implemented by adding the Reactor Coolant Suction/Discharge Nozzles, and the Shutdown Cooling Branch Piping to Fatigue Pro Version 4.0. The inspectors observed that the resultant evaluation, using seven plant transients such as a step load increase of 10%, is described in vendor report SIR-96-006. The inspectors noted that the commitment requirement to use an environmental factor of 1.5 for the evaluation of austenitic stainless steel components is inconsistent with NRC guidance. Exelon performed the evaluation by using the environmental fatigue equations and modified strain rates in NRC publications NUREG/CR 5704 for stainless steels, NUREG/CR 6583 for low-alloy steels, and NUREG/CR 6909 for nickel based alloys.

The inspectors reviewed Calculation FP-CCNP-304 which calculated the bounding fatigue locations compared to NUREG/CR 6260. Changes were made to the Calvert Cliffs FMP as a result of this analysis to include components that were not included in NUREG/CR 6260 but, at the same time, did not exceed the limits of the components listed in the NUREG. CCNPP staff referred to these as sentinel locations.

Enclosure

b. Findings

No findings were identified.

.14 Reactor Vessel Surveillance Program

a. Inspection Scope

Commitment 18 – “Comprehensive Reactor Vessel Surveillance Program (CRVSP).
Note: Unit 1 has two supplemental capsules that are designated for testing in 2000 and 2012.”

This commitment was reduced in NRC Inspection Procedure IP71003, for brevity, from the discussion in NUREG 1705, Appendix E, Item #69 which states:

“The CCNPP surveillance program implements the requirements of 10 CFR Part 50, Appendix H, and provides the necessary data to monitor the embrittlement status of the reactor vessels. Calvert Cliffs has five surveillance capsules for each unit to provide sufficient RPV material property changes and fluence information as suggested in American Society for Testing and Materials (ASTM) E185-82 to meet the requirements of 10 CFR Part 50, Appendix H. through the current license period. Each CCNPP unit also has one standby surveillance capsule to meet future needs (e.g., life extension, radical fuel management changes, etc.), as required. Because certain Unit 1 welds may be more susceptible to neutron embrittlement than originally expected, and because the RPV materials included in the original CCNPP surveillance program are less susceptible than the critical weld; BGE further extended this program into a CRVSP beginning in 1991. This CRVSP includes factors to identify and obtain test results and materials representative of the CCNPP RPVs from all available sources. These results to date demonstrate that CCNPP RPVs will remain well within established regulatory limits through the period of extended operation. In addition, BGE is participating in Combustion Engineering Owners Group (CEOG) programs targeted toward improving the accuracy of current processes and industry standards for determining the resistance of RPV materials to initiation and propagation of cracks (fracture toughness). The regulations already require embrittlement and loss of upper shelf energy projections be updated to account for any significant changes in the projected values of RTpts or change in the expiration date for operation of the facility. Baltimore Gas and Electric Company (BGE) will continue to make periodic adjustments of neutron embrittlement and loss of upper shelf energy predictions, as needed, to account for any new information on the RPV beltline materials.

In addition, BGE will make the following modifications to the CRVSP. The capsule withdrawal schedule will be revised to provide data at neutron fluence equal to or greater than the projected peak neutron fluence at the end of the period of extended operation.

If the last capsule is withdrawn before the 55th year, BGE will establish reactor vessel neutron environment conditions (fluence, spectrum, temperature, and neutron flux) applicable to the surveillance data and the Unit's pressure-temperature curves. If the plant operates outside the limits established by these conditions, the applicant must inform the NRC and determine the impact of the condition on RPV integrity.

If the last capsule is withdrawn before the 55th year, BGE will install neutron dosimetry to permit tracking of the fluence to the RPV. Therefore, there is reasonable assurance that the effects of neutron irradiation on the CCNPP RPs will be managed."

The inspectors noted the capsules that are the subject of the commitment are for the purpose of verifying environmental equivalency with McGuire, Unit 1 Nuclear Power Plant because the adjusted reference temperature of the Calvert Cliffs reactor vessel intermediate shell axial weld is calculated using the McGuire, Unit 1 surveillance weld data. This was done because the surveillance weld capsule in the McGuire vessel was fabricated using the same heat number weld wires used in the fabrication of the intermediate shell axial weld in the Calvert Unit 1 reactor vessel. This results in more realistic embrittlement degradation than using the available capsules in the Calvert Unit One vessel.

The inspectors verified the supplemental surveillance capsule withdrawal schedule was revised in accordance with the commitment. Originally capsule S-1 was scheduled to be withdrawn in 2000, and S-2 in 2012. This has been revised to 2012 and 2024 respectively.

b. Findings

No findings were identified.

.15 Fatigue Monitoring Program

a. Inspection Scope

Commitment 19 – "The FMP will be modified to perform an engineering evaluation for CEDM/RVLMS components to ensure that the components are bounded."

The inspectors reviewed CCNPP Administrative Procedures EN-1-300, "Implementation of Fatigue Monitoring," Revision 0300, and Procedure EN-1-115, "Recording of Plant Transients/Operational Cycles," Revision 0300. The inspectors noted in Section 1.2 Scope/Applicability Part E, that this commitment was addressed by expansion of the program. Reference AMBD-0049 in the procedure described the changes made to SD0029 (Vendor Report No. SIR-96-006) and the FatiguePro4 software to address this commitment.

b. Findings

No findings were identified

Enclosure

.16 Analysis of Control Element Assembly (CEA) Shroud Bolts

a. Inspection Scope

Commitment 21: - "Analysis of control element assembly (CEA) shroud bolts."

The inspectors reviewed the commitment implementation plan, NRC safety evaluation report, implementation procedures and associated work orders. For this commitment, CCNNP staff provided an analysis to confirm the assumptions made regarding CEA shroud bolts and their functions during accident conditions. The analysis concluded the aging effects of shroud bolts was below screening criteria based on factors including the combination of the susceptibility to aging and the potential for loss of function due to materials degradation. The inspectors determined that this conclusion was correct based on additional factors such as the likelihood of an accident occurring and the consequence of the damage. The inspectors discussed this commitment with applicable plant staff and license renewal personnel and reviewed the EPRI analysis that was completed for the nuclear industry and credited in NEI 03-08; "Guideline for the Management of Materials Issues" inspections were scheduled.

b. Findings

No findings were identified.

.17 Fatigue Analysis for Transients on Components

a. Inspection Scope

Commitment 24 – "A fatigue analysis will be performed to show that the stress ranges and expected number of transients for these components: CS (plates and ribs only), CSTR (tie rods, nuts, and set screws only), CSC, and CSP will be low enough that thermal fatigue will not impair their intended function during the period of extended operation."

The inspectors noted that Westinghouse performed a generic analysis (Westinghouse Letter LTR-RIAM-13-141, Rev 0, November 20, 2013) in accordance with MRP-227-A, "Materials Reliability Program: Pressurized Water Reactor Internals Inspection and Evaluation Guidelines," of the Core Support Plate, Core Support Barrel, Core Lower Support Structure, flexure welds which encompasses the components referred to in commitment 24 above. This analysis shows the stress ranges, and expected number of transients, for these components will not impair their intended function during the extended period of operation.

b. Findings

No findings were identified.

.18 Auxiliary Feedwater Pump Turbine Overhaul

a. Inspection Scope

Commitment 27 – “Technical Procedure TURB-01, "Auxiliary Feedwater Pump Turbine Overhaul," disassembles the turbine to inspect for damage. Measurements are taken to assure critical tolerances are within acceptance criteria. Specific subcomponents are inspected for wear, erosion, pitting, and/or surface cracking.”

The inspectors reviewed the aging management basis document, and Technical Procedure TURB-01, Auxiliary Feedwater Pump Turbine Overhaul, Revision 906. The turbine overhaul procedure had been revised to include specific inspection steps to determine whether there was degradation on subcomponents including turbine casing, piping, and coolers. The critical tolerances were already included in the procedure when included in the license renewal application. In addition, Technical Procedure VALVE-28, Auxiliary Feedwater Pump Turbine Governor Valve Overhaul, Revision 301, had been revised to include specific inspection steps to identify whether there was degradation on various valve subcomponents. On February 26, 2014, the inspectors observed the overhaul of the 11 auxiliary feedwater pump turbine and governor valve using these two procedures, and discussed these activities with the system engineer.

b. Findings

No findings were identified.

.19 Clean and Inspection of Emergency Diesel Generator (EDG) Air Start Distributor and Check Valves

a. Inspection Scope

Commitment 30 – “Clean and inspect EDG Air Start Distributor and CKVs (MPM13000) will be modified to inspect specifically for corrosion and piping and check for the presence of debris in valves that could indicate the piping in these systems is undergoing corrosion.”

The inspectors verified that CCNPP Technical Procedure EDG-11 “Cleaning and Inspection of Air Start Distributor and Check Valves,” Revision 2 included the appropriate references to inspect for corrosion in piping and check for the presence of debris. Specifically Section 6.2, Step 5, Step 16, and Section 6.3, Step 5 included the appropriate requirement. The inspectors noted these steps were highlighted as a license renewal commitment requirement and the basis document AMBD-0042 was referenced.

The inspectors verified this activity was implemented by reviewing MAXIMO records PM10242011 (B) and PM20242050(B). AMBD-0042, (applicable to Commitments 31-35 also) noted at 2.6 “Acceptance Criteria”, that “Any significant degradation is evaluated by personnel qualified in accordance with procedure CNG-AM-1.01-1006, “Qualification and

Certification of Non-Destructive Examination Personnel.” The inspectors verified the guidance indicates a technician (qualified in non-destructive examination techniques) evaluate significant corrosion discovered by the maintenance personnel performing the checklist.

b. Findings

No findings were identified.

.20 EDG Lube OIL Strainers and Baskets

a. Inspection Scope

Commitment 31 – “Clean/Inspect 2B, 1B, and 2A, EDG Lube Oil “Y” Strainers and Baskets (MPM13003, MPM1304, and MPM13005) will be modified to check for signs of corrosion on the “Y” strainer internal surfaces.”

The inspectors reviewed checklists MPM13003, MPM1304, and MPM13005 noting the current revision of each checklist included an introductory statement that “Performance of this checklist is credited for discovery of effects of corrosion of internal surfaces of the strainers. (AMBD-0042)”. The checklists included specific instructions to inspect for signs of corrosion products on the internal surfaces of the strainers. The inspectors reviewed applicable MAXIMO records indicating the checklists had been implemented with the noted revisions.

b. Findings

No findings were identified.

.21 Overhaul of EDG Check Valves

a. Inspection Scope

Commitment 32 – “Disassemble, inspect, and overhaul EDG CKV (MPM07006) will be modified to inspect specifically for corrosion of piping and check for the presence of debris in valves that could indicate the piping in these system is undergoing corrosion.”

The inspectors reviewed the current revision of Checklist MPM07006 noting the checklist included an introductory statement that “Performance of this checklist is credited for discovery of effects of general corrosion, crevice corrosion, and pitting of the internal of the valves (AMBD-0042).” The checklist directed CCNPP staff to inspect the valve for evidence of corrosion products and debris and to notify the system engineer if corrosion products or debris were found. The inspectors reviewed the relevant MAXIMO records showing the most recent application of the checklist (PM10242019[B] and PM10242021[B]).

b. Findings

No findings were identified.

.22 EDG Air Intake Filters

a. Inspection Scope

Commitment 33 – “Inspect EDG Air Intake Filters (MPM07117) will be modified to inspect the attached piping for signs of corrosion.”

The inspectors reviewed the current revision of Checklist MPM07117 noting the checklist included an introductory statement that “Performance of this checklist is credited for discovery of effects of corrosion and fatigue for the intake filters, intake and exhaust mufflers as well as the attached piping (AMBD-0042).” The checklist specifically required CCNPP staff to perform an internal inspection of the intake muffler and to examine the components for pitting crevice corrosion and general corrosion. The inspectors reviewed MAXIMO records 10242032[B] and 20242013[B] showing the revised checklist had been performed and the record indicated this activity involved a license renewal commitment.

b. Findings

No findings were identified.

.23 EDG Air Start Valves and Filters

a. Inspection Scope

Commitment 34 – “Inspect EDG Air Start Valves and Filters (MPM13002) will be modified to inspect specifically for corrosion of piping and check for presence of debris in valves that could indicate the piping in these systems is undergoing corrosion.”

The inspectors verified that checklist MPM13002 for the EDG air start valves and filters was revised to include the requirement to inspect specifically for corrosion of piping and check for presence of debris in the valves. Step F of the checklist stated “Inspect for rust within and debris found during valve dis-assembly.” The procedure further identified this step as license renewal related by referencing AMBD-0042 for the EDG air starting systems. The inspectors reviewed MAXIMO records 10242018[B], 0242027[B], and 20242001[B] indicating when this checklist had been utilized. The inspectors also reviewed related work orders C90849886, C91320591, and C220092223 to determine if corrosion debris was discovered and appropriately addressed.

b. Findings

No findings were identified.

.24 Visual Examination of EDG Exhaust Components

a. Inspection Scope

Commitment 35 – “Perform visual examination of EDG Exhaust components (MPM13110) will be modified to look for signs of fatigue on the external surfaces of the EDG exhaust piping and exhaust mufflers.”

The inspectors noted that MPM13110 was limited to the control side exhaust extension elbow and checklist MPM0717 was more broadly applicable to the internal and external surfaces of the intake filter, intake and exhaust mufflers as well as attached piping. The inspectors determined that CCNPP staff satisfied commitment 35 by revising MPM0717 to include provisions for inspection for signs of fatigue on the external surfaces of the exhaust piping and mufflers. This inspectors reviewed MAXIMO records 10242032[B] and 20242013[B] with associated work orders C91664766, C92-71671, and C9136800 to verify the revised checklist was being applied.

b. Findings

No findings were identified.

.25 Service Water Pump Overhaul

a. Inspection Scope

Commitment 41 – “SRW Pump Overhaul (PUMP-15) will be modified to include inspections for general corrosion, crevice corrosion/pitting on the pump casing and bushings.”

The inspectors reviewed the aging management basis document, Technical Procedure PUMP-15, Service Water Pump Overhaul, Revision 00600, and a 2002 work order that implemented this procedure to address excessive bushing wear. The pump overhaul procedure had been revised to include a specific inspection step to identify whether there was or corrosion on various subcomponents, including the casing and bushings.

b. Findings

No findings were identified.

.26 Boric Acid Corrosion Program Tasks

a. Inspection Scope

Commitment 42 – “Repetitive Task 10672001 will be modified to explicitly call for inspection of the components for signs of boric acid corrosion.”

The inspectors reviewed documentation, performed a walkthrough inspection, and discussed the status of implementation of the commitment with CCNPP technical and management personnel. The inspectors determined that CCNPP staff had implemented a program of repetitive inspection tasks for Boric Acid Corrosion. The tasks were described in Administrative Procedure MN-3-123. The current revision 00400 described responsibilities and requirements for inspection and documentation. The inspectors reviewed a sample of completed inspection reports included in Commitment Tracking Package, Book #42 for this commitment.

b. Findings

No findings were identified.

.27 Cable Aging Management Program

a. Inspection Scope

Commitment 44 – “Implement Cable Aging Management Program for cables that serve as the electrical path between electrical components in order to provide ac or dc power required for component operation, voltage or current signals for component control functions, and voltage and current signals for instrumentation signals.”

The inspectors reviewed the LRA, NRC safety evaluation report, the cable aging management program, and the associated completed work orders. The inspectors reviewed samples of inspection results associated with testing and walk-downs of Medium Voltage Cables and Low Voltage Cables to provide an indication of the condition of the conductor insulation and any adverse environment areas. The inspectors also reviewed the inspection program and completed work orders that included inspection of water accumulation in manholes to determine the adequacy of drainage methods to prevent cable submergence.

The inspectors concluded that CCNPP staff had performed adequate evaluations, including reviews of industry experience and plant operating history to determine appropriate aging effects. The inspectors further determined that program-level documents provided adequate guidance to ensure that the aging effects were appropriately identified and addressed.

b. Findings

No findings were identified.

.28 PM Program to Include Specific Age Related Degradation

a. Inspection Scope

Commitment 45 – “Modify existing PM program to include specific age related degradation mechanisms where they are not presently included and/or additional specified components/subcomponents are not presently inspected for electrical commodities.”

The inspectors reviewed the license renewal application, NRC safety evaluation report, and the electrical commodities aging management programs, which included the miscellaneous panels, motor control center (MCC) cabinets, switchgear/disconnect cabinets, bus cabinets, circuit breaker cabinets, local control station panels, battery terminals, charger cabinets, and inverter cabinets. The inspectors reviewed procedures and work orders associated with these electrical commodities to verify whether the inspection program effectively managed the aging effects and appropriately inspected for evidence of electrical stress, fatigue, corrosion, wear, and dynamic loading. The inspectors reviewed drawings, completed work orders, and performed plant tours to evaluate the capability of the programs to manage aging effects.

The inspectors concluded that CCNPP staff had performed adequate evaluations, including reviews of industry experience and plant history to determine appropriate aging effects. Also program-level documents provided adequate guidance to ensure that the aging effects of electrical commodities were appropriately identified and addressed.

b. Findings

No findings were identified.

.29 Fuse Holder Inspection Program

a. Inspection Scope

Commitment 46 – “Implement Fuse Holder Inspection Program in accordance with ISG-05, “Identification and Treatment of Electrical Fuse Holders for License Renewal.”

The inspectors reviewed CCNPP staff’s approach to scoping and screening of electrical fuse holders in accordance with ISG-05, “Identification and Treatment of Electrical Fuse Holders for License Renewal.” This document stated that, consistent with 10 CFR 54.4(a) specified requirements, fuse holders (including fuse clips and fuse blocks) are considered passive electrical components. Fuse holders should be scoped, screened, and included in the aging management review (AMR) in the same manner as terminal blocks and other types of electrical connections treated in the process. The inspectors reviewed the aging management basis document for electrical fuse holders to determine if appropriate effects of aging were identified and addressed.

The inspectors concluded that CCNPP staff had performed adequate evaluations, including appropriate scoping of fuse holders into the aging management program. The inspectors also determined that program-level documents provided adequate guidance to ensure that the aging effects of fuse holders were appropriately identified and addressed.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On July 10, 2014, the inspectors presented the inspection results to Mr. George Gellrich, Site Vice President, and other members of the CCNPP staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

G. Gellrich, SVP (Phone)
M. Flaherty, Plant General Manager
K. Bodine, Programs
D. Fiore, CCNP
D. Schrumpf, Maintenance
T. Chen, Engineering
J. Swailes, CCNP

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

None

Closed

None

LIST OF DOCUMENTS REVIEWED

Aging Management Program Documents

AMBD-0036, Cable Aging Management Program, Revision 0100
AMBD-0004, Component Cooling System & Service Water System, 0200
AMBD-0052, MN-1-319, Structure and System Walkdowns, Revision 0100
AMBD-0015, Electrical Commodities – Group 1 Battery Terminals/Chargers and Inverter Cabinets, Revision 0100
AMBD-0016, Electrical Commodities – Group 2 Breaker Panels, Revision 0100
AMBD-0017, Electrical Commodities – Group 3 Bus Cabinets, Revision 0100
AMBD-0018, Electrical Commodities – Group 4 MCC Panels, Revision 0100
AMBD-0019, Electrical Commodities – Group 5 Local Control Station Panels, Revision 0100
AMBD-0020, Electrical Commodities – Group 6 Miscellaneous Panels, Revision 0100
AMBD-0010, Water Chemistry Program, Revision 0200
AMBD-0027, CASS Evaluation Program
AMBD-0029, HVAC Systems Preventative Maintenance Procedure, Revision 0100
AMBD-0038, Check Valve Erosion Corrosion Inspection Main Feedwater System, Revision 0100
AMBD-0043, Reactor Vessel Internals Program: License Renewal Aging Management Basis Document, Revision 0100
AMBD-0053, Containment Procedure, Revision 0200
Commitment Tracking Package, Book 4 for Commitment 4
Commitment Tracking Package, Book 6 for Commitment 6
Commitment Tracking Package, Book 8 for Commitment 8
Commitment Tracking Package, Book 9 for Commitment 9
Commitment Tracking Package, Book 10 for Commitment 10
Commitment Tracking Package, Book 11 for Commitment 11
Commitment Tracking Package, Book 12 for Commitment 12
Commitment Tracking Package, Book 42 for Commitment 42

Procedures:

BUS-011K, 4kV Busses 11 and 12 Inspection, Testing, and Cleaning, Revision 00501
CNG-AM-1.01-1029, Cable Aging Management Program, Revision 00200
CR-2012-001320, Cable A1B1104Q, Pressurizer heater Cables has Cracks in the Jacket
E-19, Clean and Inspect ITE Series 5600, Wyle-Spectrum Technologies, and Nuclear Logistics Inc. Motor Control Center Cubicles, Revision 01204
FTI-114, Radiation Monitoring Drawer Calibration Check, Revision 01300
MN-1-211, Instrument Calibration Program, Revision 00301
STP M-559-0, Control Room Ventilation Radiation Monitoring Channel Calibration, Revision 00003
STP M-568-1, Containment Atmosphere Radiation Monitoring Channel Calibration, Revision
CNG-NL-1.00-1006, Commitment Management, Revision 00200
MN-3-316, Control of the Reactor Vessel Internals Program, Revision 00101
MN-3-123, Rev. 00400, Boric Acid Corrosion Control Program
REP-1073-510, Calvert Cliffs Nuclear Power Plant 35th Year Surveillance, Revision 0

STP-663-1, Calvert Cliffs Nuclear Power Plant Technical Procedure Unit 1, Containment
 Station Administrative Procedure EN-1-300, Rev 00300
 Station Administrative Procedure MN-319, Rev 01000
 Tendon Surveillance – Full Scope Examination, Revision 01100
 Technical Procedure: Valve-19, Feedwater Check Valve Inspection and Repair, Revision 00600
 MN-1-319, Structure and System Walkdowns, Revision 01000
 PUMP-15, Service Water Pump Overhaul, Revision 00700
 TURB-01, Auxiliary Feedwater Pump Turbine Overhaul, Revision 00906
 VALVE-28, Auxiliary Feedwater Pump Turbine Governor Valve Overhaul, Revision 00301

Work Orders:

Work Order 1200203669, Clean and Inspect MCC 101BT Per EMP06092
 Work Order 1200501335, Perform E-19 on Breakers 52-10436 & 52-10450, Inspect
 Local Control Panel for Age Degradation
 Work Order C90715356, Inspect 52-1130 and Controls Per EPM64607
 Work Order C90953228, Clean and Inspect Control Room Panel Cabinets
 Work Order C91078038, Inspect 1CHGR11/52-1111 and Control Circuit Per EPM02500
 Work Order C91214348, Inspect 1DISC1D1206 4kV Unit Bus 12 1A02
 Work Order C91746445, 1A & 0C EDG Building Fire Panels Battery Checks
 Work Order C91927581, 125 VDC Battery #15 Quarterly Checks Per BAT-034
 Work Order C91936660, Inspect #11 120VAC Inverter Section 2 00501
 Work Order C90709144, Radiation Monitoring Drawer Calibration Check on Control
 Work Order C92049443, Inspection of Manholes 1MH21, 1MH24, and Handholes
 1HH25, 1HH26
 Work Order C92208691, Walkdown all cable trays in the Unit 1 Auxiliary Building, elevation 27
 Work Order C92229523, Walkdown all cable trays in the Unit 1 Auxiliary Building, elevations –
 15' and -10'
 Work Order C91442284, 125 VDC Battery #14 Discharge Test
 199801424, 11 CR HVAC AHU supports
 199801425, 12 CR HVAC AHU supports
 2200102401, 21 Service water pump – excessive bushing wear

 C91951271-180, Disassemble 11 AFW pump turbine for overhaul
 C91953233-160, Overhaul 11 AFW pump governor valve 1CV3987
 120044290
 120084840 90949329
 120084959 90949365
 120084960 91509862
 220094192 91512725
 220094193

Maintenance Orders:

2200200737

2200503481

BAT-034, Diesel Generator Battery Quarterly Check, Revision 00202

AMBD-0055, Electrical Commodities – Group 7 Electrical Fuse Holders, Revision 0000

BAT-036, 0C DG Battery Service Test, Revision 00301

BAT-037, 1A DG Battery Service Test, Revision 00302

STP M-550-1, 12 Station Battery Service Test, Revision 01100

STP M-550-2, 22 Station Battery Service Test, Revision 01003

STP M-552-1, 11 Station Battery Service Test, Revision 01400

STP M-552-2, 21 Station Battery Service Test, Revision 00905

Miscellaneous:

EPRI: Materials Reliability Program, Screening, Categorization, and Ranking of Reactor Internals Components for Westinghouse and Combustion Engineering PWR Design (MRP-191) Technical Report

Final Report for the 35th Year Tendon Surveillance at Calvert Cliffs, Revision A

Formulas for Determining Factors to be Used During Unit 1 Tendon Surveillance Performance After 2002 Tendon Replacement and Restressing, 11865—3349.4, Revision 0

NUREG 1705, Safety Evaluation Report Related to the License Renewal of the Calvert Cliffs Nuclear Power Plant

RAI Response Request for Additional Information for the Review of Calvert Cliffs Nuclear Power Plant Unit 1 and Unit 2, Integrated Plant Assessment Report for Feedwater System (11/12/1998)

RAI Response Request for Review of Calvert Cliffs Nuclear Power Plant Unit 1 and Unit 2 for Reactor Vessel Internals System (11/19/1998)

RAI Response Request for Additional Information for the Review of Calvert Cliffs Nuclear Power Plant, Unit 1 and Unit 2, Integrated Plant Assessment Reports for Structures and Electrical Commodities (11/19/1998)

Engineering Service Package ES199801193, Control Room HVAC Air Handling Units, Revision 0

Walkdown Checklist, 11 Service Water System, completed February 26, 2014

Calculation No.: CA06959, Rev. 0

Letter from C. Cruz to the Nuclear Regulatory Commission, Subject Calvert Cliffs Nuclear Power Plant Units Nos. 1 & 2; Docket Nos. 50-17 & 50-318, Revision to Reactor Vessel Surveillance Capsule Withdrawal Schedule, June 28, 2010

E. J. Long and J. I. Duo, "Analysis of Capsule 284c from the Calvert Cliffs Unit No. 1 Reactor Vessel

Radiation Surveillance Program," VCAP-17365-P, Revision 0-A, February 2011.

Letter from Michael L. Boyle, NRI, to Robert E. Olinton, BG&E, Subject: Request for Approval to Use Plant-Specific Data for Reactor Vessel Fracture Toughness Analysis, Calvert Cliffs Nuclear Power Plant, Unit No. 1 (TAC No. M88316), July 29, 1994. Enclosure: Safety Evaluation by the Office of Nuclear Reactor Regulation, Baltimore Gas and Electric Company, Calvert Cliffs Nuclear Power Plant, Unit No. 1

LIST OF ACRONYMS

ADAMS	Agency-wide Documents Access and Management System
AMP	Aging Management Program
AMR	Aging Management Review
ANL	Argonne National Laboratory
ASTM	American Society for Testing & Materials
BGE	Baltimore Gas & Electric
CCNPP	Calvert Cliffs Nuclear Power Plant
CASS	Cast Austenitic Stainless Steel
CEA	Control Element Assembly
CEDM	Control Element Drive Mechanism
CFR	Code of Federal Regulations
CKV	Check Valve
CRVSP	Comprehensive Reactor Vessel Surveillance Program
CS	Core Shroud
CSC	Core Support Column
CSP	Core Support Plate
CSTR	Core Shroud Tie Rod
EDG	Emergency Diesel Generator
EPRI	Electric Power Research Institute
FMP	Fatigue Monitoring Program
GALL	NRC Generic Aging Lessons Learned (Report)
HVAC	Heating, Ventilation and Air Conditioning
LRA	License Renewal Application
MOV	Motor Operated Valve
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
PM	Preventive Maintenance
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RIS	Regulatory Issue Summary
RTpts	Pressurized Thermal Shock Reference Temperature
RV	Relief Valve
RVI	Reactor Vessel Internals
RVLMS	Reactor Vessel Level Monitoring System
SDC	Shutdown Cooling
SDP	Significance Determination Process
SFCHC	Spent Fuel Cask Handling Crane
SFP	Spent Fuel Pool
SRW	Service Water
STP	Surveillance Test Procedure
UFSAR	Updated Final Safety Analysis Report