APPENDIX A
FINAL SAFETY ANALYSIS REPORT SUPPLEMENT (LICENSE RENEWAL)

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A.0 INTRODUCTION

The application for a renewed operating license is required by 10 CFR 54.21(d) to include a FSAR Supplement. This appendix, which includes the following sections, comprises the FSAR supplement:

- Sections A.0.1 contains a listing of the aging management programs that correspond to NUREG-1801 programs, including the current status of the program.
- Sections A.0.2 contains a listing of the plant specific aging management programs, including the current status of the program.
- Sections A.0.3 contains a listing of the time-limited aging analysis aging management programs, including the current status of the program.
- Section A.1 contains a summarized description of the NUREG-1801 programs for managing the effects of aging.
- Section A.2 contains a summarized description of the plant specific programs for managing the effects of aging.
- Section A.3 contains a summarized description of the NUREG-1801 programs that support the TLAAs.
- Section A.4 contains a summarized description of the Time-Limited Aging Analyses (TLAAs) applicable to the period of extended operation.
- Section A.5 contains the License Renewal Commitment List

The integrated plant assessment for license renewal identified new and existing aging management programs necessary to provide reasonable assurance that systems, structures, and components within the scope of license renewal will continue to perform their intended functions consistent with the Current Licensing Basis (CLB) for the period of extended operation. The period of extended operation is defined as 20 years from the unit's current operating license expiration date.

A.0.1 NUREG-1801 AGING MANAGEMENT PROGRAMS

The NUREG-1801 Aging Management Programs (AMPs) are described in the following sections. The AMPs are either consistent with generally accepted industry methods as discussed in NUREG-1801 or require enhancements.

The following list reflects the status of these programs. Commitments for program additions and enhancements are identified in the appropriate sections.

1. ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (Section A.1.1) [Existing – Requires Enhancement]
2. Water Chemistry (Section A.1.2) [Existing]
3. Reactor Head Closure Studs (Section A.1.3) [Existing]
4. BWR Vessel ID Attachment Welds (Section A.1.4) [Existing]
5. BWR Feedwater Nozzle (Section A.1.5) [Existing]
6. BWR Control Rod Drive Return Line Nozzle (Section A.1.6) [Existing]
7. BWR Stress Corrosion Cracking (Section A.1.7) [Existing]
8. BWR Penetrations (Section A.1.8) [Existing]

9. BWR Vessel Internals (Section A.1.9) [Existing – Requires Enhancement]
10. Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) (Section A.1.10) [New]
11. Flow-Accelerated Corrosion (Section A.1.11) [Existing]
12. Bolting Integrity (Section A.1.12) [Existing]
13. Bolting Integrity – FRCT (Section A.1.12A) [New]
14. Open-Cycle Cooling Water System (Section A.1.13) [Existing]
15. Closed-Cycle Cooling Water System (Section A.1.14) [Existing – Requires Enhancement]
16. Closed-Cycle Cooling Water System – FRCT (Section A.1.14A) [New]
17. Boraflex Rack Management Program (Section A.1.15) [Existing]
18. Inspection of Overhead Heavy Load and Light Load Related to Refueling) Handling Systems (Section A.1.16) [Existing – Requires Enhancement]
19. Compressed Air Monitoring (Section A.1.17) [Existing]
20. BWR Reactor Water Cleanup System (Section A.1.18) [Existing]
21. Fire Protection (Section A.1.19) [Existing – Requires Enhancement]
22. Fire Water System (Section A.1.20) [Existing – Requires Enhancement]
23. Aboveground Outdoor Tanks (Section A.1.21) [New]
24. Aboveground Outdoor Tanks – FRCT (Section A.1.21A) [New]
25. Fuel Oil Chemistry (Section A.1.22) [Existing – Requires Enhancement]
26. Fuel Oil Chemistry – FRCT (Section A.1.22A) [New]
27. Reactor Vessel Surveillance (Section A.1.23) [Existing – Requires Enhancement]
28. One-Time Inspection (Section A.1.24) [New]
29. One-Time Inspection - FRCT (Section A.1.24A) [New]
30. Selective Leaching of Materials (Section A.1.25) [New]
31. Selective Leaching of Materials - FRCT (Section A.1.25A) [New]
32. Buried Piping Inspection (Section A.1.26) [Existing – Requires Enhancement]
33. Buried Piping Inspection - FRCT (Section A.1.26A) [New]
34. Buried Piping and Tank Inspection – Met Tower Repeater Engine Fuel Supply (Section A.1.26B) [New]
35. ASME Section XI, Subsection IWE (Section A.1.27) [Existing]
36. ASME Section XI, Subsection IWF (Section A.1.28) [Existing – Requires Enhancement]
37. 10 CFR Part 50, Appendix J (Section A.1.29) [Existing]
38. Masonry Wall Program (Section A.1.30) [Existing]
39. Structures Monitoring Program (Section A.1.31) [Existing – Requires Enhancement]
40. RG 1.127, Inspection of Water-Control Structures associated With Nuclear Power Plants (Section A.1.32) [Existing – Requires Enhancement]
41. Protective Coating Monitoring and Maintenance Program (Section A.1.33) [Existing]
42. Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (Section A.1.34) [New]
43. Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits (Section A.1.35) [Existing – Requires Enhancement]
44. Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (Section A.1.36) [New]
45. Periodic Monitoring of Combustion Turbine – Electrical (Section A.1.37) [New]

46. Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components – FRCT (Section A.1.38) [New]
47. Lubricating Oil Analysis Program – FRCT (Section A.1.39) [New]
48. Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (Section A.1.40) [New]

A.0.2 PLANT SPECIFIC AGING MANAGEMENT PROGRAMS

The plant specific programs are described in the following sections. The following list reflects the status of these programs. Commitments for program additions and enhancements are identified in the appropriate sections.

1. Periodic Testing of Containment Spray Nozzles (Section A.2.1) [Existing]
2. Lubricating Oil Monitoring Activities (Section A.2.2) [Existing – Requires Enhancement]
3. Generator Stator Water Chemistry Activities (Section A.2.3) [Existing]
4. Periodic Inspection of Ventilation Systems (Section A.2.4) [Existing – Requires Enhancement]
5. Periodic Inspection Program (Section A.2.5) [New]
6. Periodic Inspection Program - FRCT (Section A.2.5A) [New]
7. Wooden Utility Poles Program (Section A.2.6) [New]

A.0.3 TIME-LIMITED AGING ANALYSES AGING MANAGEMENT PROGRAMS

The NUREG-1801 Time-Limited Aging Analyses AMPs are described in the following sections. The AMPs are either consistent with generally accepted industry methods as discussed in NUREG-1801 or require enhancements. The following list reflects the status of these programs. Commitments for program additions and enhancements are identified in the appropriate sections.

1. Metal Fatigue of Reactor Coolant Pressure Boundary (Section A.3.1) [Existing – Requires Enhancement]
2. Environmental Qualification (EQ) Program (Section A.3.2) [Existing]

A.0.4 TIME-LIMITED AGING ANALYSIS SUMMARY

Summaries of the Time-Limited Aging Analyses applicable to the period of extended operation are included in the following sections.

1. Neutron Embrittlement of the Reactor Vessel and Internals (Section A.4.1)
2. Metal Fatigue of the Reactor Vessel, Internals, and Primary Coolant Boundary Piping and Components (Section A.4.2)
3. Environmental Qualification of Electrical Equipment (EQ) (Section A.4.3)
4. Fatigue of Primary Containment, Attached Piping, and Components (Section A.4.4)
5. Other Plant-Specific TLAAs (Section A.4.5)

A.0.5 QUALITY ASSURANCE PROGRAM AND ADMINISTRATIVE CONTROLS

Oyster Creek Generating Station

The existing Oyster Creek Quality Assurance Program implements the requirements of 10 CFR 50, Appendix B, and is consistent with the summary in Appendix A.2, "Quality Assurance For Aging Management Programs (Branch Technical Position IQMB-1)" of NUREG-1800. The Quality Assurance Program includes the elements of corrective action, confirmation process, and administrative controls, and these elements are applicable to the safety-related and non-safety related systems, structures, and components (SSCs) that are subject to Aging Management Review (AMR). In many cases, existing activities were found adequate for managing aging effects during the period of extended operation.

Forked River Combustion Turbine Power Plant

The Oyster Creek CLB credits the Forked River Combustion Turbine power plant, located adjacent to the Oyster Creek site, as the Alternate AC power source utilized to cope with a postulated Station Blackout (SBO) event. The Forked River Combustion Turbine power plant is not owned by Exelon. Therefore, the Oyster Creek Quality Assurance Program is not implemented for Forked River station activities that are not performed by Exelon personnel.

For the in-scope portions of the Forked River Combustion Turbine power plant, several aging management programs will be implemented. The Oyster Creek Structures Monitoring Program (B.1.31) scope will be expanded to include the required structural inspections. The Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B.1.36) program scope will include the required cable testing for the Forked River Combustion Turbine power plant. The Periodic Monitoring of Combustion Turbine Power Plant – Electrical (B.1.37) program will include the required electrical commodity visual inspections for the Forked River Combustion Turbine power plant. The Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B.1.40) program scope will include electrical cable connections at the Forked River Combustion Turbine power plant.

The structural aging management program (B.1.31) and the three electrical aging management programs (B.1.36, B.1.37, and B.1.40) applicable to the Forked River Combustion Turbine power plant will be implemented by Exelon personnel under the existing SBO Agreement between Exelon and FirstEnergy, utilizing the Oyster Creek 10 CFR 50 Appendix B Quality Assurance Program.

The mechanical aging management programs applicable to the Forked River Combustion Turbine power plant are closely tied to Forked River plant operation and maintenance activities, and therefore the associated aging management activities may be implemented by Exelon or by the organizations responsible for operation and maintenance of the combustion turbines. In either case, Exelon will continue oversight activities in accordance with the SBO Agreement. Exelon will ensure that processes and procedures that address the aging management program elements of corrective action, confirmation process, and administrative

controls, applicable to the non-safety related Forked River Combustion Turbine power plant mechanical systems, structures, and components that are subject to Aging Management Review (AMR), are established prior to the period of extended operation.

A.1 NUREG-1801 AGING MANAGEMENT PROGRAMS

This section provides summaries of the NUREG-1801 programs credited for managing the effects of aging.

A.1.1 ASME SECTION XI INSERVICE INSPECTION, SUBSECTIONS IWB, IWC, AND IWD

The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD aging management program is an existing program that consists of periodic volumetric and visual examinations of components for assessment, identification of signs of degradation, and establishment of corrective actions. The inspections will be implemented in accordance with 10 CFR 50.55(a).

For the isolation condensers this program also includes enhancement activities identified in NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," lines IV.C1-5 and IV.C1-6. These are new activities in addition to those required by ASME Section XI, Subsections IWB, IWC, and IWD. The isolation condenser test and inspection enhancement activities detect cracking due to stress corrosion cracking or intergranular stress corrosion cracking, and detect loss of material due to general, pitting and crevice corrosion. These enhancement activities verify that significant degradation is not occurring, and therefore that the intended function of the isolation condenser is maintained during the extended period of operation. These enhancement activities consist of temperature and radioactivity monitoring of the shell side water, which will be implemented prior to the period of extended operation, and eddy current testing of the tubes, with inspection (VT or UT) of the tubesheet and channel head, which will be performed during the first ten years of the extended period of operation.

These activities include inspections, and monitoring and trending of results to confirm that again effects are managed.

A.1.2 WATER CHEMISTRY

The Water Chemistry aging management program is an existing program whose activities consist of monitoring and control of water chemistry to manage the aging of piping, piping components, piping elements and heat exchangers that are exposed to treated water to keep peak levels of various contaminants below system-specific limits based on industry-recognized guidelines of BWRVIP-190: "BWR Vessel and Internals Project BWR Water Chemistry Guidelines," for the prevention or mitigation of loss of material, reduction of heat transfer and cracking aging effects. In addition, the water chemistry program is also credited for mitigating loss of material and cracking for components exposed to sodium pentaborate and boiler treated water environments. To mitigate aging effects on component surfaces the chemistry program are used to control water chemistry for impurities that accelerate corrosion.

A.1.3 REACTOR HEAD CLOSURE STUDS

The Reactor Head Closure Studs aging management program is an existing program that provides for condition monitoring and preventive activities to manage stud cracking. The program is implemented through station procedures based on the examination and inspection requirements specified in ASME Section XI, Table IWB-2500-1 and preventive measures described in Regulatory Guide 1.65, “Materials and Inspection for Reactor Vessel Closure Studs.”

A.1.4 BWR VESSEL ID ATTACHMENT WELDS

The BWR Vessel ID Attachment Welds aging management program is an existing program that includes (a) inspection and flaw evaluation in conformance with the guidelines of staff-approved boiling water reactor vessel and internals project BWRVIP-48-A and (b) monitoring and control of reactor coolant water chemistry in accordance with the guidelines of BWRVIP-190.

A.1.5 BWR FEEDWATER NOZZLE

The BWR Feedwater Nozzle aging management program is an existing program that provides for monitoring of feedwater nozzles for cracking through station procedures based on the 1995 Edition through 1996 Addendum of ASME Section XI, Subsection IWB, Table IWB 2500-1. The program specifies periodic ultrasonic (UT) inspections of critical regions of the feedwater nozzle. The inspections are performed at intervals not exceeding ten years.

The Oyster Creek Feedwater Nozzle aging management program will be enhanced to implement the recommendations of the BWR Owners Group Licensing Topical Report General Electric (GE) NE-523-A71-0594-A, Revision 1. These enhancements will be implemented prior to entering the period of extended operation.

A.1.6 BWR CONTROL ROD DRIVE RETURN LINE NOZZLE

The BWR Control Rod Drive Return Line nozzle aging management program is an existing program that provides for monitoring of the control rod drive return line nozzle for cracking through station procedures based on ASME Section XI, Subsection IWB, Table IWB 2500-1, augmented by inspections performed in accordance with the inspection recommendations of NUREG-0619, "BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking." Based on an NRC approved relief request the periodic dye penetrate tests required by NUREG-0619 have been replaced by ultrasonic measurements. The inspections will be performed at intervals not exceeding ten years. Modifications were made to the control rod drive return line nozzle thermal sleeve to mitigate or prevent thermally induced fatigue cracking.

A.1.7 BWR STRESS CORROSION CRACKING

The BWR Stress Corrosion Cracking aging management program is an existing program based on NUREG-0313, "Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping," GL 88-01, "NRC Position on Intergranular Stress Corrosion Cracking (IGSCC) in BWR Austenitic Stainless Steel Piping," and its Supplement 1, BWRVIP-75-A, "Technical Basis for Revisions to Generic Letter 88-01 Inspection Schedules," and ASME Section XI. The scope of the BWR Stress Corrosion Cracking aging management program includes reactor coolant pressure boundary components and piping four inches and larger nominal pipe size made of stainless steel and exposed to reactor coolant above 200°F. The program includes (a) replacements and preventive measures to mitigate mitigates intergranular stress corrosion cracking (IGSCC) and (b) inspections to monitor IGSCC and its effects. Water chemistry is controlled through implementation of the recommendations of BWRVIP-190: “BWR Vessel and Internals Project BWR Water Chemistry Guidelines.”

The BWR Stress Corrosion Cracking aging management program will be enhanced to include:

- The program requires that, for those components within the scope of the BWR Stress Corrosion Cracking aging management program, all new and replacement SS materials be low-carbon grades of SS with carbon content limited to 0.035 wt. % maximum and ferrite content limited to 7.5% minimum. This requirement will be added to the Line Specifications for all applicable license renewal systems.

Enhancements will be implemented prior to the period of extended operation.

A.1.8 BWR PENETRATIONS

The BWR Penetrations aging management program is an existing program that includes (a) inspection and flaw evaluation in conformance with the guidelines of staff-approved Boiling Water Reactor Vessel and Internals Project (BWRVIP)-49-A, “Instrument Penetration Inspection and Flaw Evaluation Guidelines,” and BWRVIP-27-A, “BWR Standby Liquid Control System/Core Plate Delta-P Inspection and Flaw Evaluation Guidelines,” documents and (b) monitoring and control of reactor coolant water chemistry in accordance with industry-recognized guidelines of BWRVIP-190: “BWR Vessel and Internals Project BWR Water Chemistry Guidelines,” to ensure the long-term integrity and safe operation of boiling water reactor vessel internal components. The requirements of ASME Section XI will be implemented in accordance with 10 CFR 50.55(a).

A.1.9 BWR VESSEL INTERNALS

The BWR Vessel Internals aging management program is an existing program that mitigates the effects of stress corrosion cracking (SCC), intergranular stress corrosion cracking (IGSCC), and irradiation assisted stress corrosion cracking (IASCC) in reactor pressure vessel internals through water chemistry activities that are implemented through station procedures and are consistent with the guidelines of BWRVIP-190: " BWR Vessel and Internals Project BWR Water Chemistry Guidelines." The program also manages the integrity of reactor pressure vessel internals through condition monitoring activities that consist of examinations implemented through station procedures consistent with the recommendations of the BWRVIP guidelines, as well as the requirements of ASME Section XI.

The BWR Vessel Internals program at Oyster Creek is consistent with the guidelines contained in BWRVIP-94, Rev 1, "BWR Vessel and Internals Project, Program Implementation Guideline." Inspections and evaluations of reactor components are consistent with the guidelines provided in the following BWRVIP reports:

- BWRVIP-18-A, BWR Core Spray Inspection and Flaw Evaluation Guidelines
- BWRVIP-18-R1, BWR Core Spray Inspection and Flaw Evaluation Guidelines
- BWRVIP-25, BWR Core Plate Inspection and Flaw Evaluation Guidelines
- BWRVIP-26-A, BWR Top guide Inspection and Flaw Evaluation Guidelines
- BWRVIP-27-A, BWRVIP Standby Liquid Control System/Core Spray/ Core Plate ΔP Inspection and Flaw Evaluation Guidelines.
- BWRVIP-38, BWR Shroud Support Inspection and Flaw Evaluation guidelines
- BWRVIP-47-A, BWR Lower Plenum Inspection and Flaw Evaluation Guidelines
- BWRVIP-48-A, Vessel ID Attachment Weld Inspection and Flaw Evaluation Guidelines.
- BWRVIP-49-A, Instrument Penetration Inspection and Flaw Evaluation Guidelines.
- BWRVIP-74-A, BWR Reactor Pressure Vessel Inspection and Flaw Evaluation Guidelines.
- BWRVIP-76-R1, BWR Core Shroud Inspection and Flaw Evaluation Guidelines
- BWRVIP-76-A, BWR Core Shroud Inspection and Flaw Evaluation Guidelines
- BWRVIP-104," Evaluation and Recommendations to Address Shroud Support Cracking in BWRs"

The program will be enhanced to include inspection of the steam dryer in accordance with BWRVIP-139-A. The program will also be enhanced to inspect the top guide as recommended in NUREG-1801. In addition, the program will be revised to include rolling of the CRD stub tubes as a permanent repair, once the NRC approves the ASME code case (Draft Code Case N-730). If Code Case N-730 is not approved, Oyster Creek will develop a permanent ASME code repair

plan. This permanent ASME code repair could be performed in accordance with BWRVIP-58-A, which has been approved by the NRC, or an alternate ASME code repair plan that would be submitted for prior NRC approval. If it is determined that the repair plan needs prior NRC approval, Oyster Creek will submit the repair plan two years before entering the period of extended operation. After the implementation of an approved permanent roll repair, if there is a leak in a CRD stub tube, Oyster Creek will weld repair any leaking CRD stub tubes during the extended period of operation by implementing a permanent NRC approved ASME Code repair for leaking stub tubes that cannot be made leak tight using a roll expansion method, prior to restarting the plant.

Oyster Creek will revise its Reactor internals program to also manage the aging effect of loss of material due to the aging mechanisms of pitting and crevice corrosion for Reactor Internals.

Oyster Creek will comply with all the applicable requirements that will be specified in the staff's final safety evaluations (SEs) of the BWRVIP-76-A and BWRVIP-38 reports, and that it will complete all the license renewal action items in the final SE applicable to Oyster Creek, when they are issued.

The Reactor Internals program will be enhanced to include inspection for loss of material for the feedwater sparger, steam separator, RPV surveillance capsule holders and baffle plate.

The Reactor Internals Program will be enhanced to include and document the condition of the CRD and Feedwater Nozzle thermal sleeves to ensure future inspections look for thermal sleeve bypass flow.

Exelon is committed to following BWRVIP guidelines:

- Oyster Creek will inform the (NRC) staff of any decision to not fully implement a BWRVIP guidelines approved by the staff within 45 days of the report
- Oyster Creek will notify the staff if changes are made to the RPV and its internals' programs that affect the implementation of the BWRVIP report.
- Oyster Creek will submit any deviation from the existing flaw evaluation guidelines that are specified in the BWRVIP report.

Enhancements to the program will be implemented prior to entering the period of extended operation.

A.1.10 THERMAL AGING AND NEUTRON IRRADIATION EMBRITTLEMENT OF CAST AUSTENITIC STAINLESS STEEL (CASS)

The Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless steel (CASS) aging management program is a new program that will provide for aging management of CASS reactor internal components within the

scope of license renewal. The program will be implemented prior to the period of extended operation.

The program will include a component specific evaluation of the loss of fracture toughness in accordance with the criteria specified in NUREG 1801, XI.M13. This detailed component-specific evaluation is a generic industry activity that is being addressed by the BWRVIP. The evaluation is currently budgeted for completion in 2007, after which Oyster Creek will implement the requirements of the BWRVIP guidelines. If industry activities do not complete in a timely manner, Exelon will perform the required evaluations. In either case, the following information will be submitted to the NRC at least one year prior to the period of extended operation: 1) the type and composition of CASS reactor internal components within the scope of license renewal; and 2) the results of evaluations performed to determine susceptibility to thermal aging and neutron irradiation embrittlement. For those components where loss of fracture toughness may affect function of the component, a supplemental inspection will be performed. This inspection will ensure the integrity of the CASS components exposed to the high temperature and neutron fluence present in the reactor environment.

A.1.11 FLOW-ACCELERATED CORROSION

The Flow-Accelerated Corrosion (FAC) aging management program is an existing program based on EPRI guidelines in NSAC-202L-R2, "Recommendations for an Effective Flow Accelerated Corrosion Program." The program predicts, detects, and monitors wall thinning in piping, fittings, valve bodies, and Feedwater Heaters due to FAC. Analytical evaluations and periodic examinations of locations that are most susceptible to wall thinning due to FAC are used to predict the amount of wall thinning in pipes, fittings, and Feedwater Heater shells. Program activities include analyses to determine critical locations, baseline inspections to determine the extent of thinning at these critical locations, and follow-up inspections to confirm the predictions. Repairs and replacements are performed as necessary.

A.1.12 BOLTING INTEGRITY

The Bolting Integrity aging management program is an existing program that incorporates industry recommendations of EPRI NP 5769, "Degradation and Failure of Bolting in Nuclear Power Plants," and includes periodic visual inspections of closure bolting for loss of bolting function. Inspection of Class 1, 2, and 3 components is conducted in accordance with ASME Section XI. The requirements of ASME Section XI will be implemented in accordance with 10 CFR 50.55(a). The Oyster Creek program addresses the guidance contained in EPRI TR-104213, Bolted Joint Maintenance & Applications Guide, however the report is not specifically cited as a reference in the Exelon corporate or stations' specific bolted joint inspection/repair procedures. Site procedures will be enhanced to include reference to EPRI TR-104213, Bolted Joint Maintenance & Application Guide, December 1995.

Non-ASME Class 1, 2 and 3 bolted joint inspections rely on detection of visible leakage during maintenance or routine observation. If these pressure retaining bolted joint connections are observed to be leaking, then the leakage is evaluated as part of the corrective action process. The corrective action process may allow for pressure retaining components (not covered by ASME Section XI) that are reported to be leaking to be inspected daily. If the leak rate does not increase, the inspection frequency may be decreased to biweekly or weekly.

The Bolting Integrity program does not address Primary Containment pressure retaining, structural and component support bolting. Primary Containment pressure retaining bolting are addressed by ASME Section XI, Subsection IWE, B.1.27. The Structures Monitoring Program, B.1.31 addresses the aging management of structural bolting. The ASME Section XI, Subsection IWF program, B.1.28, addresses aging management of ASME Section XI Class 1, 2, and 3 and Class MC support members.

A.1.12A BOLTING INTEGRITY – FRCT

The Bolting Integrity - FRCT aging management program is a new program that provides for condition monitoring of bolts and bolted joints within the scope of license renewal at the Forked River Combustion Turbine power plant. The Forked River Combustion Turbine power plant was originally designed and supplied by General Electric Company. This program is based on the General Electric recommendations for proper bolting material selection, lubrication, preload application, installation and maintenance associated with the combustion turbine units and auxiliary systems. The program also includes periodic walkdown inspections for bolting degradation or bolted joint leakage at a frequency of at least once every four years. The program manages the loss of material and loss of preload aging effects. This new program will be implemented prior to entering the period of extended operation.

A.1.13 OPEN-CYCLE COOLING WATER SYSTEM

The Open-Cycle Cooling Water System (OCCWS) aging management program is an existing program that manages aging of piping, piping components, piping elements and heat exchangers that are included in the scope of license renewal for loss of material and reduction of heat transfer and are exposed to raw water - salt water at Oyster Creek. Program activities include (a) surveillance and control of biofouling (including biocide injection), (b) verification of heat transfer capabilities for components cooled by the Service Water and Emergency Service Water systems, (c) inspection and maintenance activities, (d) walkdown inspections, and (e) review of maintenance, operating and training practices and procedures. Inspections may include visual, UT, and Eddy Current Testing (ECT) methods. The program will be enhanced to include specificity on inspection of heat exchangers for loss of material due to general, pitting, crevice, galvanic and microbiologically influenced corrosion in the RBCCW, TBCCW and Containment Spray preventative maintenance tasks. Additionally, the program will be enhanced to include volumetric inspections, for piping that has been replaced, at a minimum of 4 aboveground locations every 4 years based on the

observed and anticipated performance of the new pipe. Enhancements to the program will be implemented prior to entering the period of extended operation. The OCCWS aging management program is based on the recommendations of NRC Generic Letter 89-13.

A.1.14 CLOSED-CYCLE COOLING WATER SYSTEM

The Closed-Cycle Cooling Water System aging management program is an existing program that manages aging of piping, piping components, piping elements and heat exchangers that are included in the scope of license renewal for loss of material and reduction of heat transfer and are exposed to a closed cooling water environment at Oyster Creek. The Closed-Cycle Cooling Water System aging management program relies on preventive measures to minimize corrosion by maintaining inhibitors and by performing non-chemistry monitoring consisting of inspection and nondestructive examinations (NDEs) based on industry-recognized guidelines of EPRI 1007820, "Closed Cooling Water Chemistry Guidelines," for closed-cycle cooling water systems. Station maintenance inspections and NDE provide condition monitoring of heat exchangers exposed to closed-cycle cooling water environments.

A.1.14A CLOSED-CYCLE COOLING WATER SYSTEM – FRCT

The Closed-Cycle Cooling Water System – FRCT aging management program is a new program that manages aging of piping, piping components, piping elements and heat exchangers that are included in the scope of license renewal for loss of material and cracking, and are exposed to a closed cooling water environment at the Forked River Combustion Turbine power plant. The Closed-Cycle Cooling Water System – FRCT aging management program relies on preventive measures to minimize corrosion by maintaining water chemistry control parameters and by performing system monitoring and maintenance inspection activities to confirm that the aging effects are adequately managed. Chemistry control, performance monitoring and inspection activities are based on industry-recognized guidelines of EPRI TR-107396, "Closed Cooling Water Chemistry Guidelines," for closed-cycle cooling water systems.

Chemical control parameters will be monitored by annual water chemistry sampling. System operational monitoring activities will be performed at a frequency of at least once every six months. This new program will be implemented prior to entering the period of extended operation.

A.1.15 BORAFLEX RACK MANAGEMENT PROGRAM

The Boraflex Rack Management Program is an existing program that provides for aging management of the Boraflex neutron poison material. The program consists of monitoring the condition of Boraflex by routinely sampling fuel pool silica levels, periodically trending the condition of Boraflex using RACKLIFE, and periodically performing in-situ measurement of boron-10 areal density using the BADGER device. The BADGER device test is conducted every 3 years.

A.1.16 INSPECTION OF OVERHEAD HEAVY LOAD AND LIGHT LOAD (RELATED TO REFUELING) HANDLING SYSTEMS

The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems aging management program is an existing program that confirms the effectiveness of the maintenance monitoring program and the effects of past and future usage on the structural reliability of cranes and hoists. Administrative controls ensure that only allowable loads are handled. As discussed in Crane Load Cycle Limit time-limited aging analysis (TLAA), the projected number of load cycles for 60 years is significantly lower than the design value and thus fatigue is not a concern for cranes during the period of extended operation. Cranes and hoists structural components, including the bridge, the trolley, bolting, lifting devices, and the rail system are visually inspected periodically for loss of material. Bolting is also monitored for loss of preload by inspecting for missing, detached, or loosened bolts. The program relies on procurement controls and installation practices, defined in plant procedures, to ensure that only approved lubricants and proper torque are applied to bolting.

Prior to the period of extended operation, the scope of the program will be enhanced to include additional hoists that have been identified as being in scope for license renewal per 10CFR54.4(a)(2). The program will also be enhanced to include inspections for rail wear, and loss of material, due to corrosion, of crane and hoist structural components**.**

A.1.17 COMPRESSED AIR MONITORING

The Compressed Air Monitoring aging management program is an existing program that consists of inspection, monitoring, and testing; including (1) pressure decay testing and visual inspections of system components; and (2) preventive monitoring that checks air quality at various locations in the system to ensure that dewpoint, particulates, and suspended hydrocarbons are kept within the specified limits. This program is consistent with responses to NRC Generic Letter 88-14 and incorporates ISA-S7.0.01-1996, "Quality Standard for Instrument Air."

A.1.18 BWR REACTOR WATER CLEANUP SYSTEM

The BWR Reactor Water Cleanup System aging management program is an existing program that describes the requirements for augmented inservice inspection (ISI) for stress corrosion cracking (SCC) or intergranular stress corrosion cracking (IGSCC) on stainless steel Reactor Water Cleanup System piping welds outboard of the second containment isolation valves. The program includes inspection guidelines delineated in NUREG-0313, Rev. 2 and NRC Generic Letter (GL) 88-01. The program also provides for water chemistry control in accordance with BWRVIP-190: “BWR Vessel and Internals Project BWR Water Chemistry Guidelines,” to minimize the potential of crack initiation and growth due to SCC or IGSCC.

In accordance with Generic Letter (GL) 88-01, Supplement 1, upgrades and enhancements have been implemented to the RWCU isolation valves in accordance with Generic Letter 89-10 to ensure that the valves will produce sufficient thrust to perform their design basis function, which is the isolation of containment in the event of a pipe break downstream of the valves. Based on these upgrades/enhancements, an effective Hydrogen Water Chemistry program, and the complete lack of cracking found during any of the RWCU piping weld inspections under Generic Letter 88-01, all inspection requirements for the portion of the RWCU System outboard of the second containment isolation valves have been eliminated.

Reactor coolant system (RCS) chemistry activities that support the aging management program for the RWCU System consist of preventive measures that are used to manage cracking in license renewal components exposed to reactor water and steam. RCS chemistry activities provide for monitoring and controlling RCS water chemistry using Oyster Creek procedures and processes based on BWRVIP-190: "BWR Vessel and Internals Project BWR Water Chemistry Guidelines." The BWR Water Chemistry Guidelines include information to develop proactive plant-specific water chemistry programs to minimize IGSCC.

A.1.19 FIRE PROTECTION

The Fire Protection aging management program is an existing program that includes a fire barrier inspection program and a diesel-driven fire pump inspection program. The fire barrier inspection program requires periodic visual inspection of fire barrier penetration seals, fire wraps, fire barrier walls, ceilings, and floors, and periodic visual inspection and functional tests of fire rated doors to ensure that their operability is maintained. The program includes surveillance tests of fuel oil systems for the diesel-driven fire pumps to ensure that the fuel supply lines can perform intended functions. The program also includes visual inspections and periodic operability tests of halon and carbon dioxide fire suppression systems based on NFPA codes.

The Fire Protection aging management program will be enhanced to include:

- Specific fuel supply inspection criteria for fire pumps during tests
- Inspection of external surfaces of the halon and carbon dioxide fire suppression systems
- Additional inspection criteria for degradation of fire barrier walls, ceilings, and floors
- Criteria for biennial inspection of clearances for fire doors in the scope of license renewal

Enhancements will be implemented prior to the period of extended operation.

A.1.20 FIRE WATER SYSTEM

The Fire Water System aging management program is an existing program that provides for system pressure monitoring, fire system header flow testing, pump performance testing, hydrant flushing, water sampling and visual inspections activities. System flow tests measure hydraulic resistance and compare results with previous testing, as a means of evaluating the internal piping conditions. Monitoring system piping flow characteristics ensures that signs of internal piping degradation from significant corrosion or fouling would be detected in a timely manner. Pump performance tests, hydrant flushing and system inspections are performed in accordance with applicable NFPA standards. A motor driven pump normally maintains fire water system pressure. Significant leakage (exceeding the capacity of this pump) would be identified by automatic start of the diesel driven fire pumps, which would initiate immediate investigation and corrective action.

The program will be enhanced to include sprinkler head testing in accordance with NFPA 25, “Inspection, Testing and Maintenance of Water-Based Fire Protection Systems.” Samples will be submitted to a testing laboratory prior to being in service 50 years. This testing will be repeated at intervals not exceeding 10 years.

Prior to the period of extended operation, the program will be enhanced to include water sampling for the presence of MIC at an interval not to exceed 5 years, periodic non-intrusive wall thickness measurements of selected portions of the fire water system at an interval not to exceed every 10 years, and visual inspection of the redundant fire water storage tank heater (tank pressure retaining surfaces) during tank internal inspections.

A.1.21 ABOVEGROUND OUTDOOR TANKS

The Aboveground Outdoor Tanks aging management program is a new program that will manage corrosion of outdoor carbon steel and aluminum tanks. Paint is a corrosion preventive measure, and periodic visual inspections will monitor degradation of the paint and any resulting metal degradation of carbon steel tanks or the unpainted aluminum tank. The in scope carbon steel tanks are both supported by structural steel and by earthen or concrete foundations. The aluminum tank is supported by an earthen foundation. Therefore, inspection of the sealant or caulking at the tank-foundation interface, and UT inspection of inaccessible tank bottoms apply only to those tanks on earthen and concrete pads. Removal of insulation will permit visual inspection of insulated tank surfaces and caulking. This new inspection program will be implemented prior to the period of extended operation.

A.1.21A ABOVEGROUND STEEL TANKS – FRCT

The Aboveground Steel Tanks - FRCT aging management program is a new program that will manage corrosion of aboveground outdoor steel tanks. Paint coating is a corrosion preventive measure, and periodic visual inspections will monitor degradation of the paint coating and any resulting metal degradation of

tank external surfaces. The aboveground tanks external surfaces will be visually inspected for coating degradation by walkdown at least once every two years. The Main Fuel Oil storage tank is supported on a concrete foundation. This tank does not have caulking or sealing around the tank-foundation interface. All other in-scope outdoor tanks are supported by structural steel. Therefore, inspection of sealant or caulking at the tank-foundation interface does not apply to the Aboveground Steel Tanks – FRCT aging management program.

The Main Fuel Oil tank bottom is in contact with concrete and soil, and is inaccessible for visual inspection. Therefore, the program includes periodic Non-destructive wall-thickness examinations of the Main Fuel Oil tank bottom to verify that significant corrosion is not occurring.

This program, including the initial tank external paint inspections, will be implemented prior to the period of extended operation. The recommended UT inspection of the Main Fuel Oil tank bottom was performed in October 2000, so it is not necessary to perform this inspection again prior to entering the period of extended operation. Based on the results of the October 2000 inspections, and subsequent repairs to the tank floor, the tank was certified to be suitable for the storage of number 2 fuel oil for a period of time not to exceed 20 years from October 2000, before the next internal inspection would be necessary. Therefore, additional UT inspections of the tank floor are not necessary prior to entering the period of extended operation and will be performed prior to October 2020.

A.1.22 FUEL OIL CHEMISTRY

The Fuel Oil Chemistry aging management program is an existing program that includes preventive activities to provide assurance that contaminants are maintained at acceptable levels in fuel oil for systems and components within the scope of Licensing Renewal. The fuel oil tanks within the scope of license renewal are maintained by monitoring and controlling fuel oil contaminants in accordance with the guidelines of the American Society for Testing and Materials (ASTM). Fuel oil sampling and analysis is performed in accordance with approved procedures for new fuel and stored fuel. Fuel oil tanks are periodically drained of accumulated water and sediment. These activities effectively manage the effects of aging by providing reasonable assurance that potentially harmful contaminants are maintained at low concentrations. The Fuel Oil Chemistry aging management program will be enhanced to include:

- Routine analysis for particulate contamination using modified ASTM D 2276-00 Method A on fuel oil samples from the Emergency Diesel Generator Fuel Storage Tank, the Fire Pond Diesel Fuel Tanks, and the Main Fuel Oil Tank.
- Analysis for particulate contamination using modified ASTM D 2276-00 Method A on new fuel oil.
- Analysis for water and sediment using ASTM D 2709-96 for Fire Pond Diesel Fuel Tank bottom samples.

- Analysis for bacteria to verify the effectiveness of biocide addition in the Emergency Diesel Generator Fuel Storage Tank, the Fire Pond Diesel Fuel Tanks, and the Main Fuel Oil Tank.
- Periodic draining, cleaning, and inspection of the Fire Pond Diesel Fuel Tanks and the Main Fuel Oil Tank. Inspection activities will include the use of ultrasonic techniques for determining tank bottom thicknesses should there be any evidence of corrosion or pitting. As an alternative to draining, cleaning and inspecting the Fire Pond Diesel Fuel Tanks, these tanks may be replaced to ensure tank wall thickness is maintained and minimize the introduction of foreign material into the fuel oil system. Any replacement tanks will be procured to the appropriate internal cleanliness standards.
- One-time internal inspection of the Emergency Diesel Generator Day tanks to confirm the absence of aging effects.

Enhancements will be implemented prior to the period of extended operation.

A.1.22A FUEL OIL CHEMISTRY – FRCT

The Fuel Oil Chemistry - FRCT aging management program is a new program that provides assurance that contaminants are maintained at acceptable levels in new and stored fuel oil for systems and components within the scope of Licensing Renewal. The Fuel Oil Storage Tank will be maintained by monitoring and controlling fuel oil contaminants in accordance with the guidelines of the American Society for Testing Materials (ASTM). Fuel oil sampling activities will be in accordance with ASTM D 4057 for multilevel and tank bottom sampling. Fuel oil will be periodically sampled and analyzed for particulate contamination in accordance with modified ASTM Standard D 2276 Method A or ASTM Standard D 6217, and, for the presence of water and sediment in accordance with ASTM Standard D 2709 or ASTM Standard D 1796. The Fuel Oil Storage Tank will be periodically drained of accumulated water and sediment and will be periodically drained, cleaned, and internally inspected. These activities effectively manage the effects of aging by providing reasonable assurance that potentially harmful contaminants are maintained at low concentrations.

This new program will be implemented prior to entering the period of extended operation. The internal inspection of the Main Fuel Oil tank was performed in October 2000, so it is not necessary to perform this inspection again prior to entering the period of extended operation. Based on the results of the October 2000 inspections and repairs, the tank was certified to be suitable for the storage of number 2 fuel oil for a period of time not to exceed 20 years from October 2000, before the next internal inspection would be necessary. Therefore, additional internal inspections of the tank floor are not necessary prior to entering the period of extended operation and will be performed prior to October 2020.

A.1.23 REACTOR VESSEL SURVEILLANCE

The Oyster Creek Reactor Vessel Surveillance aging management program is an existing program that monitors the effects of neutron embrittlement on the reactor vessel beltline materials. The program is based on the BWR Integrated Surveillance Program (ISP) and satisfies the requirements of 10 CFR 50, Appendix H. The Reactor Vessel Surveillance program is based upon BWRVIP-78, "BWR Vessel and Internals Project: BWR Integrated Surveillance Program Plan", and BWRVIP-86-A, "BWR Vessel and Internals Project Updated BWR Integrated Surveillance Program (ISP) Implementation Plan". The program will ensure coupon availability during the period of extended operation by saving withdrawn coupons for future reconstitution, in accordance with BWRVIP-86-R1.

Oyster Creek will enhance the program to implement BWRVIP-116 "BWR Vessel and Internals Project Integrated Surveillance Program (ISP) Implementation for License Renewal," including the conditions specified by the NRC in its Safety Evaluation dated February 24, 2006.

If the Oyster Creek standby capsule is removed from the RPV without the intent to test it, the capsule will be stored in a manner that maintains it in a condition which would permit its future use, including during the period of extended operation, if necessary.

A.1.24 ONE-TIME INSPECTION

The Oyster Creek One-Time Inspection aging management program is a new program that will address potentially long incubation periods for certain aging effects and will provide a means of confirming that an aging effect is either not occurring or is progressing so slowly as to not have an effect on the intended function of a structure or component within the extended period of operation. The One-Time Inspection program will provide measures to verify that an aging management program is not needed, confirms the effectiveness of existing activities, or determines that degradation is occurring which will require evaluation and corrective action.

This program will be used for the following:

- To confirm crack initiation and growth due to stress corrosion cracking (SCC), intergranular stress corrosion cracking (IGSCC), or thermal and mechanical loading is not occurring in Class 1 piping less than four-inch nominal pipe size (NPS) exposed to reactor coolant. Inspections will include UT examination of 10% of the total small bore Class 1 butt welds and destructive or non-destructive examination of a single small bore Class 1 socket welded connection.

- To confirm the effectiveness of the Water Chemistry program to manage the loss of material and crack initiation and growth aging effects. Included in the scope of this activity, a one-time UT inspection of the "B" Isolation Condenser shell below the waterline will be conducted looking for pitting corrosion.

- To confirm the effectiveness of the Closed Cycle Cooling Water System program to manage the loss of material aging effect.

- To confirm the effectiveness of the Fuel Oil Chemistry program and Lubricating Oil Monitoring Activities program to manage the loss of material aging effect.

- To confirm loss of material in stainless steel piping, piping components, and piping elements is insignificant in an intermittent condensation (internal) environment.

- To confirm loss of material in steel piping, piping components, and piping elements is insignificant in an indoor air (internal) environment.

- To confirm loss of material is insignificant for non-safety related (NSR) piping, piping components, and piping elements of vents and drains, floor and equipment drains, and other systems and components that could contain a fluid, and, are in scope for 10CFR54.4(a)(2) for spatial interaction. The scope of the program consists of only those systems not covered by other aging management activities.

- Two stainless steel pipe sections in a stagnant or low flow area in the Reactor Water Cleanup System, and two stainless steel pipe sections in a stagnant or low flow area in the Isolation Condenser System will be included in the one-time inspection samples for stress corrosion cracking.

The inspections will be implemented prior to the period of extended operation to manage the effects of aging for selected components within the scope of license renewal.

A.1.24A ONE-TIME INSPECTION – FRCT

The One-Time Inspection – FRCT aging management program is a new program that will provide a means of confirming the aging effects of loss of material and loss of heat transfer are either not occurring or are progressing so slowly as to not have an effect on the intended function of the Combustion Turbine fuel oil and lubricating oil system components within the period of extended operation. Additionally this program will address potentially long incubation periods for loss of material and loss of heat transfer aging effects. The One-Time Inspection – FRCT program will provide measures to verify that an aging management program is not needed, confirms the effectiveness of existing activities, or determines that degradation is occurring which will require evaluation and corrective action. The program will be implemented prior to the period of extended operation.

Inspection methods will include visual examination or volumetric examinations. Inspections will be performed by qualified personnel using procedures developed consistent with the quality classification of the Forked River Combustion Turbines. Acceptance criteria will be in accordance with design standards for the combustion turbines and manufacturer's recommendations. The One-Time Inspection – FRCT program provides for the evaluation of the need for follow-up

examinations to monitor the progression of aging if age-related degradation is found that could jeopardize an intended function before the end of the period of extended operation. Should aging effects be detected, the program will initiate actions to characterize the nature and extent of the aging effect and determines what subsequent monitoring is needed to ensure intended functions are maintained during the period of extended operation.

A.1.25 SELECTIVE LEACHING OF MATERIALS

The Selective Leaching of Materials aging management program is a new program that will consist of inspections of a representative selection of components of the different susceptible materials to determine if loss of material due to selective leaching is occurring. One-time inspections will be consistent with ASME Section XI VT-1 visual inspection requirements and supplemented by hardness tests and other examinations of the selected set of components. If selective leaching is found, the condition will be evaluated to determine the need to expand inspections. This new inspection program will be implemented prior to the period of extended operation.

A.1.25A SELECTIVE LEACHING OF MATERIALS – FRCT

The Selective Leaching of Materials - FRCT aging management program is a new program that will consist of inspections of components constructed of susceptible materials to determine if loss of material due to selective leaching is occurring. For the FRCT power plant, these are limited to copper alloy materials exposed to a closed cooling water environment. One-time inspections will consist of visual inspections supplemented by hardness tests. If selective leaching is found, the condition will be evaluated to determine the ability of the component to perform its intended function until the end of the period of extended operation and for the need to expand inspections. This new program will be implemented in the time period after January 2018 and prior to January 2028.

A.1.26 BURIED PIPING INSPECTION

The Buried Piping Inspection aging management program is an existing program that manages the external surface aging effects of loss of material for piping and piping system components in a soil (external) environment. The Oyster Creek buried piping activities consist of preventive and condition-monitoring measures to manage the loss of material due to external corrosion for piping, piping system components in the scope of license renewal that are in a soil (external) environment. The program will be enhanced to include inspection of buried piping within ten years of entering the period of extended operation, unless an opportunistic inspection occurs within this ten-year period. The inspections will include at least one carbon steel, one aluminum and one cast iron pipe or component. In addition, for each of these materials, the locations selected for inspection will include at least one location where the pipe or component has not been previously replaced or recoated, if any such locations remain. The program

will also be enhanced to include the buried portions of the fire protection system and the piping located inside the vault in the scope of the program. The vault is considered a manhole that is located between the reactor building and the exhaust tunnel.

External inspections of buried components will occur opportunistically when they are excavated during maintenance. Upon entering the period of extended operation, inspection of buried piping will be performed within ten years, unless an opportunistic inspection occurs within this ten-year period. Program enhancements will be implemented prior to entering the period of extended operation.

A.1.26A BURIED PIPING INSPECTION – FRCT

The Buried Piping Inspection - FRCT aging management program is a new program that manages the external surface aging effects of loss of material for carbon steel piping and piping system components in a soil (external) environment. The program activities consist of preventive and condition-monitoring measures to manage the loss of material due to external corrosion for piping and piping system components in the scope of license renewal that are in a soil (external) environment. The program scope includes buried portions of glycol cooling water piping located at the Forked River Combustion Turbine station.

External inspections of buried components will occur opportunistically when they are excavated during maintenance. Within 10 years prior to entering the period of extended operation, inspection of buried piping will be performed unless an opportunistic inspection occurs within this ten-year period. Upon entering the period of extended operation, inspection of buried piping will again be performed within the next ten years, unless an opportunistic inspection occurs during this ten-year period. This program will be implemented prior to entering the period of extended operation.

A.1.26B BURIED PIPING AND TANK INSPECTION – MET TOWER REPEATER ENGINE FUEL SUPPLY

The Buried Piping and Tank Inspection - Met Tower Repeater Engine Fuel Supply aging management program is a new program that manages the external surface aging effects of loss of material for carbon steel and copper piping and fittings, and carbon steel tank, in a soil (external) environment. The program activities consist of preventive and condition-monitoring measures to manage the loss of material due to external corrosion for the piping, fittings, and tank in the scope of license renewal that are in a soil (external) environment. The program scope includes buried portions of the meteorological tower repeater engine fuel supply (propane) piping and tank located at the Forked River meteorological tower.

External inspections of buried components will occur opportunistically when they are excavated during maintenance. Within 10 years prior to entering the period of extended operation, inspection of buried piping components will be performed

unless an opportunistic inspection occurs within this ten-year period. Upon entering the period of extended operation, inspection of buried piping components will again be performed within the next ten years, unless an opportunistic inspection occurs during this ten-year period. This program will be implemented prior to entering the period of extended operation.

A.1.27 ASME SECTION XI, SUBSECTION IWE

The ASME Section XI, Subsection IWE aging management program is an existing program based on ASME Code and complies with the provisions of 10 CFR 50.55a. The program consists of periodic inspection of primary containment surfaces and components, including integral attachments, and containment vacuum breakers system piping and components for loss of material, loss of sealing, and loss of preload.

Examination methods include visual and volumetric testing as required by the Code. Observed conditions that have the potential for impacting an intended function are evaluated for acceptability in accordance with ASME requirements or corrected in accordance with corrective action process. Procurement controls and installation practices, defined in plant procedures, ensure that only approved lubricants and tension or torque are applied to bolting.

In accordance with commitments made during the Oyster Creek license renewal application review process, the program will be enhanced to include:

1. Ultrasonic Testing (UT) thickness measurements of the drywell shell in the sand bed region will be performed on a frequency of every 10 years, except that the initial inspection will occur prior to the period of extended operation and the subsequent inspection will occur two refueling outages after the initial inspection to provide early confirmation that corrosion has been arrested. Subsequent inspection frequency will be established as appropriate, not to exceed 10-year intervals. The UT measurements will be taken from the inside of the drywell at the same locations where UT measurements were performed in 1996. The inspection results will be compared to previous results. Statistically significant deviations from the 1992, 1994, and 1996 UT results will result in corrective actions that include the following:
   - Perform additional UT measurements to confirm the readings.
   - Notify NRC within 48 hours of confirmation of the identified condition.
   - Conduct visual inspection of the external surface in the sand bed region in areas where any unexpected corrosion may be detected.
   - Perform engineering evaluation to assess the extent of condition and to determine if additional inspections are required to assure drywell integrity.
   - Perform operability determination and justification for operation until next inspection.

   These actions will be completed prior to restart from the associated outage.

   Note: The frequency for the inspections described in commitment 1 (above) has been changed to every other refueling outage, in accordance with commitment 21 of the IWE Inspection program.

2. A strippable coating will be applied to the reactor cavity liner to prevent water intrusion into the gap between the drywell shield wall and the drywell shell during periods when the reactor cavity is flooded.

3. The reactor cavity seal leakage trough drains and the drywell sand bed region drains will be monitored for leakage:
   - The sand bed region drains will be monitored daily during refueling outages. If leakage is detected, procedures will be in place to determine the source of leakage and investigate and address the impact of leakage on the drywell shell, including verification of the condition of the drywell shell coating and moisture barrier (seal) in the sand bed region and performance of UT examinations of the shell in the upper regions. UTs will also be performed on any areas in the sand bed region where visual inspection indicates the coating is damaged and corrosion has occurred. UT results will be evaluated per the existing program. Any degraded coating or moisture barrier will be repaired. These actions will be completed prior to exiting the associated outage.
   - The sand bed region drains will be monitored quarterly during the plant operating cycle. If leakage is identified, the source of water will be investigated, corrective actions taken or planned as appropriate. In addition, if leakage is detected, the following items will be performed during the next refueling outage:

     o Inspection of the drywell shell coating and moisture barrier (seal) in the affected bays in the sand bed region
     o UTs of the upper drywell region consistent with the existing program
     o UTs will be performed on any areas in the sand bed region where visual inspection indicates the coating is damaged and corrosion has occurred
     o UT results will be evaluated per the existing program

     Any degraded coating or moisture barrier will be repaired

4. Prior to the period of extended operation, Exelon will perform additional visual inspections of the epoxy coating that was applied to the exterior surface of the Drywell shell in the sand bed region, such that the coated surfaces in all 10 Drywell bays will have been inspected at least once. In addition, the Inservice Inspection (ISI) Program will be enhanced to require inspection of 100% of the epoxy coating every 10 years during the period of extended operation. These inspections will be performed in accordance with ASME Section XI, Subsection IWE. Performance of the inspections will be staggered such that at least three bays will be examined every other refueling outage.

   Note: The scope and frequency for the inspections described in commitment 4 (above) has been changed to all 10 bays every other refueling outage, in accordance with commitment 21 of the IWE Inspection Program.

5. A visual examination of the drywell shell in the drywell floor inspection access trenches will be performed to assure that the drywell shell remains intact. If degradation is identified, the drywell shell condition will be evaluated and

corrective actions taken as necessary. In addition, one-time ultrasonic testing (UT) measurements will be taken to confirm the adequacy of the shell thickness in these areas. Beyond these examinations, these surfaces will either be inspected as part of the scope of the ASME Section XI, Subsection IWE inspection program or they will be restored to the original design configuration using concrete or other suitable material to prevent moisture collection in these areas.

Note: Commitment 5 (above) is supplemented by commitments 16 and 20 of the IWE Inspection Program.

6. The coating inside the torus will be visually inspected in accordance with ASME Section XI, Subsection IWE, per the Protective Coatings Program. The scope of each of these inspections will include the wetted area of all 20 torus bays. Should the current torus coating system be replaced, the inspection frequency and scope will, as a minimum, meet the requirements of ASME Section XI, Subsection IWE.

7. Exelon will conduct UT thickness measurements in the upper regions of the drywell shell every other refueling outage at the same locations as are currently measured.

8. The IWE Program will be credited for managing corrosion in the Torus Vent Line and Vent Header exposed to an Indoor Air (External) environment.

9. During the next UT inspections to be performed on the drywell sand bed region (reference AmerGen 4/4/06 letter to NRC), an attempt will be made to locate and evaluate some of the locally thinned areas identified in the 1992 inspection from the exterior of the drywell. This testing will be performed using the latest UT methodology with existing shell paint in place. The UT thickness measurements for these locally thinned areas may be taken from either inside the drywell or outside the drywell (sand bed region) to limit radiation dose to as low as reasonably achievable (ALARA).

   Note: Commitment 9 (above) is supplemented by commitments 14 and 21 of the IWE Inspection Program.

10. Exelon will conduct UT thickness measurements on the 0.770 inch thick plate at the junction between the 0.770 inch thick and 1.154 inch thick plates in the lower portion of the spherical region of the drywell shell. These measurements will be taken at four locations using the 6”x6” grid. The specific locations to be selected will consider previous operational experience (i.e., will be biased toward areas that have experienced corrosion or have been exposed to water leakage). These measurements will be performed prior to the period of extended operation and repeated at the second refueling outage after the initial inspection, at the same location. If corrosion in this transition area is greater than areas monitored in the upper drywell, UT inspections in the transition area will be performed on the same frequency as those in the upper drywell (every other refueling outage).

11. Exelon will conduct UT thickness measurements in the drywell shell “knuckle” area, on the 0.640 inch thick plate above the weld to the 2.625 inch thick

plate. These measurements will be taken at four locations using the 6”x6” grid. The specific locations to be selected will consider previous operational experience (i.e., will be biased toward areas that have experienced corrosion or have been exposed to water leakage). These measurements will be performed prior to the period of extended operation and repeated at the second refueling outage after the initial inspection, at the same location. If corrosion in this transition area is greater than areas monitored in the upper drywell, UT inspections in the transition area will be performed on the same frequency as those in the upper drywell (every other refueling outage).

12. When the sand bed region drywell shell coating inspection is performed (item 27, commitments 4 and 21), the seal at the junction between the sand bed region concrete and the embedded drywell shell will be inspected per the Protective Coatings Program.

    Note: The frequency for the inspections described in commitment 12 (above) has been changed to every other refueling outage, in accordance with commitment 21 of the IWE Inspection Program.

13. The reactor cavity concrete trough drain will be verified to be clear from blockage once per refueling cycle. Any identified issues will be addressed via the corrective action process.

14. UT thickness measurements will be taken from outside the drywell in the sandbed region during the 2008 refueling outage on the locally thinned areas examined during the October 2006 refueling outage. The locally thinned areas are distributed both vertically and around the perimeter of the drywell in all ten bays such that potential corrosion of the drywell shell would be detected.

    Note: The frequency for the inspections described in commitment 14 (above) has been changed to every other refueling outage, in accordance with commitment 21 of the IWE Inspection Program.

15. Starting in 2010, drywell shell UT thickness measurements will be taken from outside the drywell in the sandbed region in two bays per outage, such that inspections will be performed in all 10 bays within a 10-year period. The two bays with the most locally thinned areas (bay #1 and bay #13) will be inspected in 2010. If the UT examinations yield unacceptable results, then the locally thinned areas in all 10 bays will be inspected in the refueling outage that the unacceptable results are identified.

    Note: The scope and frequency for the inspections described in commitment 15 (above) has been changed to all 10 bays every other refueling outage, in accordance with commitment 21 of the IWE Inspection Program.

16. Perform visual inspections of the drywell shell inside the trenches in bay #5 and bay #17 and take UT measurements inside these trenches in 2008 at the same locations examined in 2006. Repeat (both the UT and visual) inspections at refueling outages during the period of extended operation until

the trenches are restored to the original design configuration using concrete or other suitable material to prevent moisture collection in these areas.

Note: Commitment 16 (above) is supplemented by commitment 20 of the IWE Inspection Program.

17. Perform visual inspection of the moisture barrier between the drywell shell and the concrete floor/curb, installed inside the drywell during the October 2006 refueling outage, in accordance with ASME Section XI, Subsection IWE during the period of extended operation.

18. Exelon will perform a 3-D finite element structural analysis of the primary containment drywell shell using modern methods and current drywell shell thickness data to better quantify the margin that exists above the Code required minimum for buckling. The analysis will include sensitivity studies to determine the degree to which uncertainties in the size of thinned areas affect Code margins. If the analysis determines that the drywell shell does not meet Code-specified safety factors (i.e., 2.0 for the refueling load case and 1.67 for the post-accident load case), the NRC will be notified in accordance with 10 CFR 50 requirements.

19. Exelon will perform an engineering study to investigate cost-effective replacement or repair options to eliminate or reduce reactor cavity liner leakage.

20. Exelon is committed to perform visual and UT inspections of the drywell shell in the inspection trenches in drywell bays 5 and 17 during the Oyster Creek 2008 refueling outage (see commitment 16 of Exelon's IWE Program (item 27), made in its letter 2130-06-20426. Exelon will extend this commitment and also perform these inspections during the 2010 refueling outage. In addition, Exelon will monitor the two trenches for the presence of water during refueling outages. Visual and UT inspections of the shell within the trenches will continue to be performed until no water is identified in the trenches for two consecutive refueling outages, at which time the trenches will be restored to their original design configuration (e.g., refilled with concrete) to minimize the risk of future corrosion. As required by license condition 2.C (12) of the renewed operating license, NRC approval must be received prior to restoring the trenches to their original design configuration.

21. Perform the full scope of drywell sand bed region inspections prior to the period of extended operation and then every other refueling outage thereafter. The full scope is defined as:
    - UT measurements from inside the drywell (commitment 1)
    - Visual inspections of the drywell external shell epoxy coating in all 10 bays (commitment 4)
    - Inspection of the seal at the junction between the sand bed region concrete and the embedded drywell shell (commitment 12)
    - UT measurements at the external locally thinned areas inspected in 2006 (commitments 9 and 14)

22. Verify that the sand bed drain lines are clear from obstruction.

A.1.28 ASME SECTION XI, SUBSECTION IWF

The ASME Section XI, Subsection IWF aging management program is an existing program that consists of periodic visual examination of ASME Section XI Class 1, 2, 3 and MC components and piping support members for loss of mechanical function and loss of material. Bolting which is included with these components is monitored for loss of material and loss of preload by inspecting for missing, detached, or loosened bolts. Identification of any aging effects would initiate evaluation and establishment of corrective actions. The requirements of ASME Section XI, Subsection IWF are implemented in accordance with 10 CFR 50.55(a). The scope of the program will be enhanced to include additional MC supports, and require inspection of underwater supports for loss of material due to corrosion and loss of mechanical function and loss of preload on bolting by inspecting for missing, detached, or loosened bolts. Procurement controls and installation practices, defined in plant procedures, ensure that only approved lubricants and torque are applied. Enhancements to the program will be implemented prior to entering the period of extended operation.

A.1.29 10 CFR PART 50, APPENDIX J

The 10 CFR Part 50, Appendix J aging management program is an existing program that monitors leakage rates through the containment pressure boundary, including the drywell and torus, penetrations, fittings, and other access openings, in order to detect age related degradation of the containment pressure boundary. Corrective actions are taken if leakage rates exceed acceptance criteria. The Appendix J program also detects age related degradation in material properties of gaskets, o-rings, and packing materials for the containment pressure boundary access points. Consistent with the current licensing basis, the containment leak rate tests are performed in accordance with the regulations and guidance provided in 10 CFR 50 Appendix J Option B, Regulatory Guide 1.163, “Performance-Based Containment Leak-Testing Program," NEI 94-01, “Industry Guideline for Implementing Performance-Based Option of 10 CFR Part 50 Appendix J,” and ANSI/ANS 56.8, “Containment System Leakage Testing Requirements.”

A.1.30 MASONRY WALL PROGRAM

The Masonry Wall Program is an existing program that is based on guidance provided in IE Bulletin 80-11, "Masonry Wall Design," and plant-specific monitoring proposed by IN 87-67, "Lessons Learned from Regional Inspections of Licensee Actions in Response to IE Bulletin 80-11," for managing cracking of masonry walls. The program requires inspection of masonry walls for cracking on a frequency of 4 years. The Masonry Wall Program is part of the Structures Monitoring Program.

A.1.31 STRUCTURES MONITORING PROGRAM

The Structures Monitoring Program is an existing program that was developed to implement the requirements of 10 CFR 50.65 and is based on NUMARC 93-01, “Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” Revision 2 and Regulatory Guide 1.160, “Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” Revision 2. The program includes elements of the Masonry Wall Program and the RG 1.127, Inspection of Water-Control Structures Associated With Nuclear Power Plants aging management program.

The program relies on periodic visual inspections to monitor the condition of structures and structural components, structural bolting, component supports, masonry block walls, water-control structures, the Fire Pond Dam, exterior surfaces of mechanical components that are not covered by other programs, and HVAC ducts, damper housings, and HVAC closure bolting. The program relies on procurement controls and installation practices, defined in plant procedures, to ensure that only approved lubricants and proper torque are applied to bolting in scope of the program.

The scope of the program will be enhanced to include structures and structural components that are not currently monitored, but determined to be in the scope of license renewal, including Station Blackout System structures and phase bus enclosure assemblies, Meteorological Tower Structures;, submerged structures, component supports not covered by other programs, the Fire Pond Dam, and exterior surfaces of Oyster Creek and Forked River Combustion Turbine mechanical components that are not covered by other programs, including exterior surfaces of HVAC ducts, damper housings, and closure bolting. The inspections will look for leakage from or onto external surfaces, worn, flaking or oxide-coated surfaces, corrosion stains on thermal insulation, and protective coating degradation (cracking and flaking). The program will also be enhanced to require removal of piping and component insulation on a sampling basis to allow visual inspection of insulated surfaces, and to require sampling and testing of groundwater every 4 years to confirm that the soil environment is non-aggressive to below-grade concrete structures. Other program scope enhancements include, but are not limited to, inspection of piping components associated with the Radio Communications system located at the meteorological tower site, and inspection of Reactor Building Closed Loop Cooling, Feedwater, and Main Steam piping located inside the Drywell. The enhancements will be made prior to entering the period of extended operation.

Inspection criteria will be enhanced to provide reasonable assurance that change in material properties, cracking, loss of material, loss of form, reduction or loss of isolation function, reduction in anchor capacity due local degradation, and loss of preload are adequately managed so that the intended functions of structures and components within the scope of the program are maintained consistent with the current licensing basis during the period of extended operation. Inspection frequency is every four (4) years maximum; except for Permali shield blocks and submerged portions of the water-control structures. Permali shield blocks will be inspected on a frequency to coincide with the ASME Section XI inspection of reactor vessel nozzles, where the material is applied. A baseline inspection of submerged water-control structures will be performed prior to entering the period of extended operation. A second inspection will be performed six years after this baseline inspection and a third inspection eight years after the second inspection. After each inspection, an evaluation will be performed to determine if identified degradation warrant more frequent inspections or corrective actions.

The Structures Monitoring Program will be enhanced to include the following specific elements:

- Buildings, structural components and commodities that are not in scope of maintenance rule but have been determined to be in the scope of license renewal. These include miscellaneous platforms, flood and secondary containment doors, penetration seals, sump liners, structural seals, and anchors and embedment.
- Component supports, other than those in scope of ASME XI, Subsection IWF.
- Inspection of Oyster Creek external surfaces of mechanical components that are not covered by other programs, HVAC duct, damper housings, and HVAC closure bolting. The scope of this enhancement includes the Reactor Building Closed Cooling Water System carbon steel piping and piping elements located inside the primary containment drywell. Inspection and acceptance criteria of the external surfaces will be the same as those specified for structural steel components and structural bolting.
- The visual inspection of insulated surfaces will require the removal of insulation. Removal of insulation will be on a sampling basis that bounds insulation material type, susceptibility of insulated piping or component material to potential degradations that could result from being in contact with insulation, and system operating temperature.
- Inspection of electrical panels and racks, junction boxes, instrument racks and panels, cable trays, offsite power structural components and their foundations, and anchorage.
- Periodic sampling, testing, and analysis of ground water to confirm that the environment remains non-aggressive for buried reinforced concrete.
- Periodic inspection of components submerged in salt water (Intake Structure and Canal, Dilution structure) and in the water of the fire pond dam, including trash racks at the Intake Structure and Canal.
- Inspection of penetration seals, structural seals, and other elastomers for change in material properties.

- Inspection of vibration isolators, associated with component supports other than those covered by ASME XI, Subsection IWF, for reduction or loss of isolation function.
- The current inspection criteria will be revised to add loss of material, due to corrosion for steel components, and change in material properties, due to leaching of calcium hydroxide and aggressive chemical attack for reinforced concrete. Wooden piles and sheeting will be inspected for loss of material and change in material properties.
- Periodic inspection of the Fire Pond Dam for loss of material and loss of form.
- Inspection of Station Blackout System structures, structural components, and phase bus enclosure assemblies.
- Inspection of Forked River Combustion Turbine power plant external surfaces of mechanical components that are not covered by other programs, HVAC duct, damper housings, and HVAC closure bolting. Inspection and acceptance criteria of the external surfaces will be the same as those specified for structural steel components and structural bolting.
- The program will be enhanced to include inspection of Meteorological Tower Structures. Inspection and acceptance criteria will be the same as those specified for other structures in the scope of the program.
- The program will be enhanced to include inspection of exterior surfaces of piping and piping components associated with the Radio Communications system, located at the meteorological tower site, for loss of material due to corrosion. Inspection and acceptance criteria will be the same as those specified for other external surfaces of mechanical components.
- The program will be enhanced to require visual inspection of external surfaces of mechanical steel components that are not covered by other programs for leakage from or onto external surfaces, worn, flaking, or oxide-coated surfaces, corrosion stains on thermal insulation, and protective coating degradation (cracking and flaking).
- To confirm that there is no significant age related degradation occurring on the external carbon steel surfaces of the main steam system located inside containment, a one-time visual inspection for loss of material due to corrosion will be performed.
- To confirm that there is no significant age related degradation occurring on the external carbon steel surfaces of the feedwater system located inside primary containment drywell, a one-time visual inspection for loss of material due to corrosion will be performed.
- Permali shield blocks will be visually inspected for loss of material and cracking. Inspection frequency will coincide with the ASME Section XI inspection of reactor vessel nozzles, where the material is applied.

A.1.32 RG 1.127, INSPECTION OF WATER-CONTROL STRUCTURES ASSOCIATED WITH NUCLEAR POWER PLANTS

The Oyster Creek RG 1.127, “Inspection of Water-Control Structures Associated with Nuclear Power Plants,” aging management program is an existing condition monitoring program that is a part of the Structures Monitoring Program. The program requires periodic inspection of the Intake Structure and Canal (UHS), and the Dilution structure concrete for loss of material, cracking, and changes in

material properties. Steel components are inspected for loss of material due to corrosion, and the earthen dike and canal slopes are monitored for loss of material and loss of form. The program will be enhanced to include periodic inspection of the Fire Pond Dam for loss of material and loss of form. Other enhancements include periodic inspection of submerged concrete, wood, and steel components for age related degradations. Inspection frequency is every four (4) years; except for submerged portions of the structures, which will be inspected (baseline) prior to entering the period of extended operation. A second inspection will be performed 6 years after this baseline inspection and a third 8 years after the second. After each inspection an evaluation will be performed to determine if the identified degradations warrant more frequent inspections or corrective actions to ensure that age-related degradation is properly managed.

A.1.33 PROTECTIVE COATING MONITORING AND MAINTENANCE PROGRAM

The Protective Coating Monitoring and Maintenance Program is an existing program that provides for aging management of Service Level I coatings inside the primary containment and Service Level II coatings for the external drywell shell in the area of the sandbed region. Service Level I coatings are used in areas where corrosion protection may be required and where coating failure could adversely affect the operation of post-accident fluid systems and thereby impair safe shutdown. Oyster Creek was not originally committed to Regulatory Guide 1.54 for Service Level I coatings because the plant was licensed prior to the issuance of this Regulatory Guide in 1974. Currently, Oyster Creek is committed to a modified version of this Regulatory Guide, as described in the response to GL 98-04, and, as detailed in the Exelon Quality Assurance Topical Report (QATR) NO-AA-10. Service Level II coatings provide corrosion protection and decontaminability in those areas outside of the primary containment that are subject to radiation exposure and radionuclide contamination. The Protective Coating Monitoring and Maintenance Program provides for inspections, assessment, and repairs for any condition that adversely affects the ability of Service Level I coatings, or sandbed region Service Level II coatings, to function as intended.

The program will be enhanced to include:

1. The inspection of Service Level I and Service Level II protective coatings that are credited for mitigating corrosion on interior surfaces of the Torus shell and vent system, and, on exterior surfaces of the Drywell shell in the area of the sandbed region, will be consistent with ASME Section XI, Subsection IWE requirements.

2. Additional visual inspections of the epoxy coating that was applied to the exterior surface of the drywell shell in the sand bed region, such that the coated surfaces in all 10 drywell bays will have been inspected at least once prior to entering the period of extended operation.

3. The inspection of the drywell sandbed region epoxy coating as specified in commitment 21 of the ASME Section XI, Subsection IWE Containment Inspection Program (Item 27).

4. The inspection of all 20 torus bays at a frequency of every other refueling outage for the current coating system. Should the current coating system be replaced, the inspection frequency and scope will be re-evaluated. Inspection scope will, as a minimum, meet the requirements of ASME Section XI, Subsection IWE.

5. When the sand bed region drywell shell coating inspection is performed under the IWE Program (Item 27, commitment 21), the seal at the junction between the sand bed region concrete and the embedded drywell shell will be inspected per the Protective Coatings Program.

Enhancements will be implemented prior to the period of extended operation and as specified during the period of extended operation.

A.1.34 ELECTRICAL CABLES AND CONNECTIONS NOT SUBJECT TO 10 CFR 50.49 ENVIRONMENTAL QUALIFICATION REQUIREMENTS

The Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements aging management program is a new program that will be used to manage aging of non-EQ cables and connections during the period of extended operation. A representative sample of accessible cables and connections located in adverse localized environments will be visually inspected at least once every 10 years for indications of accelerated insulation aging such as embrittlement, discoloration, cracking, or surface contamination. An adverse localized environment is a condition in a limited plant area that is significantly more severe than the specified service environment for a subject electrical cable or connection. This new program will be implemented prior to the period of extended operation.

A.1.35 ELECTRICAL CABLES AND CONNECTIONS NOT SUBJECT TO 10 CFR 50.49 ENVIRONMENTAL QUALIFICATION REQUIREMENTS USED IN INSTRUMENT CIRCUITS

The Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrument Circuits aging management program is an existing program that manages aging of the cables of the Intermediate Range Monitoring (IRM), Local Power Range Monitoring/Average Power Range Monitoring (LPRM/APRM), Reactor Building High Radiation Monitoring, and Air Ejector Offgas Radiation Monitoring systems that are sensitive instrumentation circuits with low-level signals and are located in areas where the cables and connections could be exposed to adverse localized environments caused by heat, radiation, or moisture. These adverse localized environments can result in reduced insulation resistance causing increases in leakage currents. Calibration testing and Current/Voltage (I/V) and Time Domain Reflectometry (TDR) testing are currently performed to ensure that the cable insulation resistance is adequate for the instrumentation circuits to perform their intended functions. Based on acceptance criteria related to instrumentation loop performance and cable testing set forth in the calibration and testing procedures, evaluation of unacceptable results is initiated under the Corrective Action

Process. The calibration testing and cable testing used for this program are performed currently, and have proven effective in identifying the existence of degradation in the performance of the tested systems. The program will be enhanced to include a review of the calibration and cable testing results for cable aging degradation as recommended by NUREG 1801 Section XI.E2. The enhanced program will be implemented prior to the period of extended operation and will include a review of the calibration and cable testing results for cable aging degradation before the period of extended operation and every 10 years thereafter.

A.1.36 INACCESSIBLE MEDIUM-VOLTAGE CABLES NOT SUBJECT TO 10 CFR 50.49 ENVIRONMENTAL QUALIFICATION REQUIREMENTS

The Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements aging management program is a new program that will be used to manage the aging of medium-voltage (2.3 kV, 4.1 kV, 13.8 kV and 34.5 kV) cable circuits at Oyster Creek. These cables may at times be exposed to moisture and may be subjected to system voltage for more than 25% of the time. Manholes, conduits and sumps associated with these cable circuits will be inspected for water collection at least once every 2 years and drained as required. The first inspections will be completed prior to the period of extended operation. In addition, the cable circuits will be tested using a proven test for detecting deterioration of the insulation system due to wetting, such as power factor or partial discharge, as described in EPRI TR-103834-P1-2, or other testing that is state-of-the-art at the time the test is performed. The cable circuits will be tested at an initial frequency of six years, after which the frequency will be evaluated and adjusted, based on test results; period between tests shall not exceed 10 years. Results of cable tests will be trended. Trending will occur at the same frequency as cable testing. This new program will be implemented prior to the period of extended operation. Inclusion of the 13.8 kV system circuits in this program reflects the scope expansion of the Station Blackout System electrical commodities. Inclusion of the 34.5 kV system circuits in this program reflects the scope enhancement for reconciliation of this aging management program from the draft January 2005 GALL to the approved September 2005 GALL.

A.1.37 PERIODIC MONITORING OF COMBUSTION TURBINE POWER PLANT – ELECTRICAL

The new Periodic Monitoring of Combustion Turbine Power Plant - Electrical Program will be used in conjunction with the existing Structures Monitoring Program and the new Inaccessible Medium Voltage Cables Not Subject to 10CFR50.49 Environmental Qualification Requirements program to manage aging effects for the electrical commodities that support Forked River Combustion Turbine (FRCT) operation. The Program consists of visual inspection of accessible electrical cables and connections exposed in enclosures, pits, manholes, and pipe trench for embrittlement, discoloration, cracking or surface contamination; visual inspection of manholes, pits and cable trenches, located on the FRCT site, for inaccessible medium voltage cables, for

water collection; and visual inspections of accessible phase bus and connections and phase bus insulators for melting or other signs of heat effects on the tape covering bus connections, cracking of thermoplastic, or degradation of insulators. Phase Bus Enclosures will be inspected by the existing Structures Monitoring Program for signs of corrosion. The inaccessible medium voltage cables circuits supporting the FRCT, and the associated manholes, pits and trenches located on the Oyster Creek site, will be tested or inspected by the new Inaccessible Medium Voltage Cables Not Subject to 10CFR50.49 Environmental Qualification Requirements program for signs of insulation degradation and for prevention of wetted environments. The new combustion turbine power plant – electrical program will be implemented prior to the period of extended operation. Manhole, pit and trench inspections for manholes, pits and trenches located on the FRCT site will be performed at least once every 2 years for accumulation of water, and the frequency will be adjusted based on the results obtained. Cable and connection inspections will be implemented prior to the period of extended operation with a frequency of at least once every 10 years. Accessible phase bus and connection and phase bus insulator inspections will be performed at least once every 5 years. Phase bus enclosure inspections will be performed at the frequency specified in the Structures Monitoring Program. Inaccessible medium voltage cable circuits and the associated manhole, pit and trench tests and inspections for the manholes, pits and trenches located on the OC site will be performed at the frequency specified in the Inaccessible Medium Voltage Cables Not Subject to 10CFR50.49 Environmental Qualification Requirements program.

A.1.38 INSPECTION OF INTERNAL SURFACES IN MISCELLANEOUS PIPING AND DUCTING COMPONENTS – FRCT

The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components - FRCT aging management program is a new program that consists of visual inspections of the internal surfaces of steel piping, valve bodies, ductwork, filter housings, fan housings, damper housings, mufflers and heat exchanger shells in the scope of license renewal at the Forked River Combustion Turbine power plant that are not covered by other aging management programs. These components are subject to an internal environment of indoor air that is assumed to include sufficient moisture content to result in loss of material aging effects. In addition, this program includes piping and mufflers with Diesel Engine Exhaust Gas as an internal environment. Internal inspections will be performed during scheduled maintenance activities when the surfaces are made accessible for visual inspection. The program includes visual inspections to assure that existing environmental conditions are not causing material degradation that could result in a loss of component intended functions. These inspections will be performed during the major combustion turbine inspection outages and will be performed on a frequency of at least once every 10 years.

The initial inspections associated with this program will be performed at the next major inspection outage for each unit. Based on an inspection frequency of 10 years, the next inspection for CT Unit 1 will be performed by May 2014, and the next inspection for CT Unit 2 will be performed by November 2015.

A.1.39 LUBRICATING OIL ANALYSIS PROGRAM - FRCT

The Lubricating Oil Analysis Program – FRCT is a new program that includes measures to verify the oil environment in mechanical equipment is maintained to the required quality. The Lubricating Oil Analysis Program – FRCT maintains oil systems contaminants (primarily water and particulates) within acceptable limits, thereby preserving an environment that is not conducive to loss of material, cracking, or reduction in heat transfer. Lubricating oil testing activities include sampling and analysis of lubricating oil for detrimental contaminants. The presence of water or particulates may also be indicative of inleakage and corrosion product buildup. The program will also include the measurement of flash point. This program is augmented by the One Time Inspection – FRCT (B.1.24A) program, to verify the effectiveness of the Lubricating Oil Analysis Program - FRCT. This new program will be implemented prior to the period of extended operation.

A.1.40 ELECTRICAL CABLE CONNECTIONS NOT SUBJECT TO 10 CFR 50.49 ENVIRONMENTAL QUALIFICATION REQUIREMENTS

The Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements aging management program is a new program that will be used to manage the aging effects of metallic parts of non-EQ electrical cable connections within the scope of license renewal during the period of extended operation. A representative sample of non-EQ electrical cable connections will be selected for testing considering application (high, medium and low voltage), circuit loading and location, with respect to connection stressors. The type of test to be performed, i.e., thermography, is a proven test for detecting loose connections. A representative sample of non-EQ cable connections will be tested at least once every 10 years. This new program will be implemented prior to the period of extended operation.

A.2 PLANT SPECIFIC PROGRAMS

This section provides summaries of the plant specific programs credited for managing the effects of aging.

A.2.1 PERIODIC TESTING OF CONTAINMENT SPRAY NOZZLES

The Periodic Testing of Containment Spray Nozzles aging management program is an existing program that provides for flow tests to demonstrate that the drywell and torus spray nozzles are not blocked by debris or corrosion products. Carbon steel piping upstream of the drywell and torus spray nozzles is subject to possible general corrosion. The periodic flow tests of drywell and torus spray nozzles address a concern that rust from the possible general corrosion may plug the spray nozzles. These periodic tests verify that the drywell and torus spray nozzles are free from plugging that could result from corrosion product buildup from upstream sources.

A.2.2 LUBRICATING OIL MONITORING ACTIVITIES

The Lubricating Oil Monitoring Activities aging management program is an existing program that manages loss of material, cracking, and fouling in lubricating oil heat exchangers, systems, and components in the scope of license renewal by monitoring physical and chemical properties in lubricating oil. Sampling, testing, and monitoring verify lubricating oil properties. Oil analysis permits identification of specific wear mechanisms, contamination, and oil degradation within operating machinery, and components of systems in scope for license renewal.

The Lubricating Oil Monitoring Activities program will be enhanced to add surveillance for verification of flow through the Fire Protection System diesel driven pump gearbox lubricating oil cooler. In addition, the program will be enhanced to include sampling and measurement for flash point of emergency diesel generator engine lubricating oil to detect contamination of lube oil by fuel oil. These enhancements will be implemented prior to the period of extended operation.

A.2.3 GENERATOR STATOR WATER CHEMISTRY ACTIVITIES

The Generator Stator Water Chemistry Activities aging management program is an existing program that manages loss of material aging effects by monitoring and controlling water chemistry. Generator stator water chemistry control maintains high purity water in accordance with General Electric and EPRI guidelines for stator cooling water systems. Generator stator water is continuously monitored for conductivity and periodically analyzed for impurities and dissolved oxygen, and an alarm annunciates if conductivity increases to a predetermined limit.

A.2.4 PERIODIC INSPECTION OF VENTILATION SYSTEMS

The Periodic Inspection of Ventilation Systems aging management program is an existing program that provides for periodic inspections of components in the ventilation systems in the scope of license renewal at Oyster Creek. The program includes inspections for penetrating corrosion on ventilation system components and evidence of aging and wear on elastomers for the portions of the systems that are within the scope of license renewal. Prior to the period of extended operation, the program will be enhanced to include duct exposed to soil, instrument piping and valves, restricting orifices and flow elements, and thermowells. The activities will also be enhanced to include inspection guidance for detection of the applicable aging effects.

A.2.5 PERIODIC INSPECTION PROGRAM

The Periodic Inspection Program is a new program that will consist of periodic inspections of selected systems to verify the integrity of the system and confirm the absence of identified aging effects. The initial inspections are scheduled for implementation prior to the period of extended operation. The purpose of the inspection is to determine if a specified aging effect is occurring. If the aging effect is occurring, an evaluation will be performed to determine the effect it will have on the ability of affected components to perform their intended functions for the period of extended operation, and appropriate corrective action is taken.

Inspection methods may include visual examination, surface or volumetric examinations. Acceptance criteria are in accordance with industry guidelines, codes, and standards. When inspection results fail to meet established acceptance criteria, an evaluation will be conducted, in accordance with the corrective action process, to establish additional actions or measures necessary to provide reasonable assurance that the component intended function is maintained during the period of extended operation. This new program will be implemented prior to the period of extended operation.

A.2.5A PERIODIC INSPECTION PROGRAM – FRCT

The Periodic Inspection Program - FRCT is a new program that will consist of periodic inspections of selected components to verify the integrity of the system and confirm the absence of identified aging effects. Inspections will be scheduled to coincide with major combustion turbine maintenance inspections, when the subject components are made accessible. These inspections will be performed on a frequency not to exceed once every 10 years. The purpose of the inspection is to determine if a specified aging effect is occurring. If the aging effect is occurring, an evaluation will be performed to determine the effect it will have on the ability of affected components to perform their intended functions for the period of extended operation, and appropriate corrective action is taken.

Inspection methods may include visual examination, surface or volumetric examinations. Acceptance criteria are in accordance with manufacturers guidelines, applicable codes, and standards. When inspection results fail to meet established acceptance criteria, an evaluation will be conducted to identify

actions or measures necessary to provide reasonable assurance that the component intended function is maintained during the period of extended operation.

The initial inspections associated with this program will be performed at the next major inspection outage for each unit. Based on an inspection frequency of 10 years, the next inspection for CT Unit 1 will be performed by May 2014, and the next inspection for CT Unit 2 will be performed by November 2015.

A.2.6 WOODEN UTILITY POLE PROGRAM

The Oyster Creek Wooden Utility Pole Program is a new program that will be used to manage loss of material and change of material properties for wooden utility poles in or near the Oyster Creek Substation that provide structural support for the conductors connecting the Offsite Power System and the 480/208/120V Utility (JCP&L) Non-Vital Power System to the Oyster Creek plant. The program consists of inspection on a 10-year interval by a qualified inspector. The wooden poles will be inspected for loss of material due to ant, insect, and moisture damage and for change in material properties due to moisture damage. This new program will be implemented prior to the period of extended operation.

A.3 TLAA EVALUATION OF AGING MANAGEMENT PROGRAMS UNDER 10 CFR54.21(C)(1)(III)

This section provides summaries of programs credited in the evaluation of Time-Limited Aging Analyses (TLAAs).

A.3.1 METAL FATIGUE OF REACTOR COOLANT PRESSURE BOUNDARY

The Metal Fatigue of Reactor Coolant Pressure Boundary aging management program is an existing program that ensures that the design fatigue usage factor limit will not be exceeded during the period of extended operation. The program will be enhanced to calculate and track cumulative usage factors for bounding locations in the reactor coolant pressure boundary (reactor pressure vessel and Class I piping), containment torus, torus vents, and torus attached piping and penetrations. The program also tracks isolation condenser fatigue stress cycles. The program will be enhanced to use the EPRI-licensed FatiguePro® cycle counting and fatigue usage factor tracking computer program, which provides for calculation of stress cycles and fatigue usage factors from operating cycles, automated counting of fatigue stress cycles, and automated calculation and tracking of fatigue cumulative usage factors. FatiguePro calculates cumulative fatigue using both cycle-based and stress-based monitoring. The program will be enhanced prior to the period of extended operation.

Prior to the period of extended operation, Exelon will revise the Oyster Creek UFSAR to update the current licensing basis to reflect that a cumulative usage factor of 1.0 will be used in fatigue analysis for reactor coolant pressure boundary components, as endorsed by the NRC in 10 CFR 50.55a.

A.3.2 ENVIRONMENTAL QUALIFICATION (EQ) PROGRAM

The Environmental Qualification (EQ) Program is an existing program that manages the aging of electrical equipment within the scope of 10 CFR 50.49, “Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants.” The program establishes, demonstrates, and documents the level of qualification, qualified configurations, maintenance, surveillance and replacements necessary to meet 10 CFR 50.49. A qualified life is determined for equipment within the scope of the program and appropriate actions such as replacement or refurbishment are taken prior to or at the end of the qualified life of the equipment so that the aging limit is not exceeded. The effects of aging on the intended functions will be adequately managed per the requirements of 10 CFR 54.21 (c)(1)(iii).

A.4 TIME-LIMITED AGING ANALYSIS SUMMARIES

As part of the application for a renewed license, 10 CFR 54.21(c) requires that an evaluation of Time-Limited Aging Analyses (TLAAs) for the period of extended operation be provided. The following TLAAs have been identified and evaluated to meet this requirement.

A.4.1 NEUTRON EMBRITTLEMENT OF THE REACTOR VESSEL AND INTERNALS

The ferritic materials of the reactor vessel are subject to embrittlement due to high energy neutron exposure. Reactor vessel neutron embrittlement is a TLAA.

A.4.1.1 Reactor Vessel Materials Upper-Shelf Energy Reduction Due to Neutron Embrittlement

The reactor vessel end-of-life neutron fluence has been recalculated for a 60-year (50 EFPY) extended licensed operating period using the RAMA methodology. The NRC has issued a SER for RAMA approving RAMA for reactor vessel fluence calculations. Oyster Creek will comply with the applicable requirements of the SER before the period of extended operation.

The 50 EFPY USE was evaluated by an equivalent margin analysis (EMA) using the 50 EFPY calculated fluence and the Oyster Creek surveillance capsule results, in accordance with the requirements of 10 CFR 54.21(c)(1)(ii).

A.4.1.2 Adjusted Reference Temperature for Reactor Vessel Materials Due to Neutron Embrittlement

The reactor vessel materials peak fluence, ΔRT_{NDT}, and ART values for the 60-year (50 EFPY) license operating period were calculated in accordance with the requirements of 10 CFR 54.21(c)(1)(ii).

A.4.1.3 Reactor Vessel Thermal Limit Analyses: Operating Pressure – Temperature Limits

Revised pressure-temperature (P-T) limits for a 60-year licensed operating life have been prepared and will be submitted to the NRC for approval prior to the start of the extended period of operation, in accordance with the requirements of 10 CFR 54.21(c)(1)(ii).

A.4.1.4 Reactor Vessel Circumferential Weld Examination Relief

Relief has been granted from the requirements for inspection of RPV circumferential welds for the remainder of the current 40-year licensed operating period. The justification for relief is consistent with the guidelines of Boiling Water Reactor Vessel and Internals Program BWRVIP-05, “BWR Reactor Pressure Vessel Shell Weld Inspection Recommendations.” Application for an

extension of this relief for the 60-year period of extended operation will be submitted prior to the end of the current operating license term.

The re-evaluation of the circumferential weld failure probability for 60 years depends on vessel ΔRT_{NDT} calculations. Although a conditional failure probability has not been calculated, the fact that the Oyster Creek 50 EFPY Mean RT_{NDT} value is less than the 64 EFPY value provided by the NRC leads to the conclusion that the Oyster Creek RPV conditional failure probability is bounded by the NRC analysis and is therefore acceptable. The procedures and training that will be used to limit the frequency of cold over-pressure events to the number specified in the SER for the RPV circumferential weld relief request extension, during the license renewal term, are the same as those approved for use in the current period end of the current operating license term.

The above analyses associated with reactor vessel circumferential weld examination relief has been projected to the end of the period of extended operation, in accordance with the requirements of 10 CFR 54.21(c)(1)(ii).

A.4.1.5 Reactor Vessel Axial Weld Examination Relief

BWRVIP-05, "BWR Reactor Pressure Vessel Shell Weld Inspection Recommendations," estimated the 40-year end-of-life failure probability of a limiting reactor vessel axial weld, showed that it was orders of magnitude greater than the 40-year end-of-life circumferential weld failure probability, and used this analysis to justify relief from inspection of the circumferential welds, as described in Section A.4.1.4 above.

The re-evaluation of the axial weld failure probability for 60 years depends on vessel ΔRT_{NDT} calculations. The NRC staff review and BWRVIP calculations of the test-case failure probabilities assume that 90 percent of axial welds will be inspected. At Oyster Creek, experience has been that less than 90 percent examination coverage of the axial welds has been achieved. As such, an analysis was performed for 50 EFPY to assess the effect on the probability of fracture due to the actual inspection performed on the vessel axial welds and to determine if the coverage was sufficient in the inspection of regions contributing to the majority of the risk.

The evaluation shows that the calculated unit-specific axial weld conditional failure probabilities at 60 years (50 EFPY) for Oyster Creek are less than the failure probabilities calculated by the NRC staff in the NRC BWRVIP-05 SER at 64 EFPY and the limiting CEOG values found in Table 3 of the SER supplement; therefore, the TLAA associated with the axial weld failure probabilities has been satisfactorily projected to the end of the period of extended operation, in accordance with the requirements of 10 CFR 54.21(c)(1)(ii).

The projected probability of failure of an axial weld at Oyster Creek, assuming the same limited inspection coverage as previously achieved, is sufficiently low to justify relief from the "essentially 100%" ASME Code coverage requirement for these axial weld examinations, should such relief (in accordance with 10 CFR 50.55(a)) be required during the extended licensed operating period.

A.4.1.6 Reactor Internals Components

The core plate, core shroud, incore instrumentation dry tubes, and top guide are exposed to high neutron fluence and are potentially susceptible to stress relaxation of bolting and irradiation assisted stress corrosion cracking (IASCC). Because the core plate has wedges installed, relaxation of the hold bolts due to is not a concern. The top guide, core shroud, and incore dry tubes are considered susceptible to IASCC and require aging management. All three components (top guide, core shroud, and incore dry tubes) have been evaluated by the BWRVIP, as described in the Inspection and Evaluation Guidelines for each component. The BWR Vessel Internals program described in Section A.1.9 will manage these aging effects.

This aging management program will ensure that aging effects in vessel internals exposed high fluence will be adequately managed for the period of extended operation, in accordance with the requirements of 10 CFR 54.21(c)(1)(iii).

A.4.2 METAL FATIGUE

The thermal and mechanical fatigue analyses of mechanical components have been identified as TLAAs for Oyster Creek. Specific components have been designed considering transient cycle assumptions, as listed in vendor specifications and the Oyster Creek UFSAR.

A.4.2.1 Reactor Vessel Fatigue Analyses

Reactor vessel fatigue analyses depend on cycle count assumptions that assume a 40-year operating period. The effects of fatigue in the reactor vessel will be managed for the period of extended operation by the Metal Fatigue of Reactor Coolant Pressure Boundary aging management program for cycle counting and fatigue usage factor tracking, as described in Section A.3.1.

This aging management program will ensure that fatigue effects in vessel pressure boundary components will be adequately managed and will be maintained within the design limits for the period of extended operation, in accordance with the requirements of 10 CFR 54.21(c)(1)(iii).

A.4.2.2 Fatigue Analysis of Reactor Vessel Internals

A.4.2.2.1 Low-cycle Thermal and Flow-Induced Vibration Fatigue Analysis of the Core Shroud and Repair Hardware

Low-cycle mechanical fatigue was evaluated only for the tie rod stabilizers in the core shroud repair evaluations. The maximum predicted CUF for the core shroud and core shroud repair hardware was found to be not significant. Therefore, the design of the core shroud repair hardware for fatigue effects is valid for the extended operating period in accordance with 10 CFR 54.21(c)(1)(i).

A.4.2.3 Reactor Coolant Pressure Boundary Piping and Component Fatigue Analysis

A.4.2.3.1 Reactor Coolant Pressure Boundary Piping and Components

Thermal cycle count is a consideration in all the codes associated with the design of reactor coolant pressure boundary and non-RCPB piping and components (e.g., USAS or ANSI B31.1).

The applicable piping codes require the use of a stress range reduction factor in the evaluation of calculated stresses due to thermal expansion. The reduction factor is based on the anticipated number of equivalent full temperature cycles over the total number of years the plant is expected to be in operation.

The number of thermal cycles assumed for design of RCPB and non-RCPB piping has been evaluated and the existing stress range reduction factor remains valid for the period of extended operation, in accordance with 10 CFR 54.21(c)(1)(i).

A.4.2.3.3 Fatigue Analysis of the Isolation Condenser

The isolation condenser components were evaluated for 1500 heatup/pressurization cycles for 40 years. A review of isolation condenser operations since 1995 and a conservative estimate of earlier condenser operations based on number of unit scrams concluded that the projected total cycle count for 60 years is well below the number of design cycles.

The isolation condenser supporting system piping and components were evaluated for 400 heatup/pressurization cycles for 40 years. The “A” isolation condenser tubes bundles were replaced in 2000 and the “B” isolation condenser tube bundles were replaced in 1998. The isolation condenser piping was replaced in 1992. Conservatively using 1992 as the starting point for isolation condenser events for these components, a review of isolation condenser events since 1992 concluded that the projected total cycle count for 60 years is well below the number of design cycles.

The analyses of the effects of thermal cycle and thermal shock events on the Oyster Creek isolation condenser systems and components have been evaluated and remain valid for the period of extended operation, in accordance with the requirements of 10 CFR 54.21(c)(1)(i).

A.4.2.4 Effects of Reactor Coolant Environment on Fatigue Life of Components and Piping (Generic Safety Issue 190)

Generic Safety Issue (GSI) 190 was identified by the NRC because of concerns about potential effects of reactor water environments on component fatigue life during the period of extended operation.

Oyster Creek has performed plant-specific calculations for the applicable locations identified in NUREG/CR 6260, "Application of NUREG/CR-5999 Interim

Fatigue Curves to Selected Nuclear Power Plant Components," for older-vintage BWR plants. For each location, detailed environmental fatigue calculations were performed using the appropriate environmental fatigue (F_{en}) relationships from NUREG/CR 6583 for carbon and low-alloy steels and from NUREG/CR 5704 for stainless steels, as appropriate for the material at each of the locations. The results demonstrate that all CUF values, including appropriate environmental effects, are less than 1.0 for 60 years of plant operation and meet the requirements for the extended operating period in accordance with 10 CFR 54.21(c)(1)(ii).

Additionally, all of the above locations are included in the Metal Fatigue of Reactor Coolant Pressure Boundary (A.3.1) aging management program, and the CUF for these locations will continue to be tracked in accordance with the requirements of 10 CFR 54.21(c)(1)(iii).

A.4.3 ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT (EQ)

Electrical equipment included in the Oyster Creek Environmental Qualification Program, which has a specified qualified life of at least 40 years, involves time-limiting aging analyses for license renewal. The aging effects of this equipment will be managed in the Environmental Qualification Program discussed in Section A.3.2, “Environmental Qualification (EQ) of Electrical Components,” in accordance with the requirements of 10 CFR 54.21(c)(1)(iii).

A.4.4 FATIGUE OF PRIMARY CONTAINMENT, ATTACHED PIPING AND COMPONENTS

The Oyster Creek Mark I containment was originally designed to stress limit criteria without fatigue analyses. However, the discovery of significant hydrodynamic loads (“new loads”) caused by safety relief valve (SRV) and small, intermediate, and design basis pipe break discharges into the suppression pool required the reanalysis of the suppression chamber, vents, and attached piping and internal structures, including some fatigue analyses at limiting locations. These fatigue analyses of the suppression chamber, and its internals, and vents in each unit included assumed pressure and temperature cycles resulting from SRV discharge and design basis LOCA events. The scope of the analyses included pressure suppression chamber, the drywell-to-pressure suppression chamber vents, SRV discharge piping, other piping attached to the suppression chamber and its penetrations, and the drywell-to-suppression chamber vent bellows.

A.4.4.1 Fatigue Analysis of the Primary Containment System (Includes Suppression Chamber, Vents, Vent Headers, and Downcomers, SRV Discharge Piping Inside the Suppression Chamber, External Suppression Chamber Attached Piping, Associated Penetrations, Drywell-to-Suppression Chamber Vent Line Bellows, and Primary Containment Process Penetrations Bellows)

For low cumulative usage factor (CUF) locations (40-year CUF < 0.4) the Oyster Creek new loads analyses of each suppression chamber and its associated vents and downcomers, piping penetrations and vent bellows have been evaluated and remain valid for the period of extended operation, in accordance with the requirements of 10 CFR 54.21(c)(1)(i).

For higher cumulative usage factor locations in the analyses of the suppression chamber and its associated vents and downcomers, piping penetrations and vent bellows (40-year CUF ≥ 0.4) the effects of fatigue will be managed for the period of extended operation by the Metal Fatigue of Reactor Coolant Pressure Boundary aging management program, as described in Section A.3.1.

The fatigue management activities will ensure that fatigue effects in containment pressure boundary components are adequately managed and are maintained within code design limits for the period of extended operation, in accordance with the requirements of 10 CFR 54.21(c)(1)(iii).

A.4.4.2 Primary Containment Process Penetrations and Bellows Fatigue Analysis

The only containment process piping expansion joints subject to significant thermal expansion and contraction are those between the drywell shell penetrations and process piping. These are designed for a stated number of operating and thermal cycles.

The thermal cycle designs of Oyster Creek containment process penetration bellows have been evaluated and remain valid for the period of extended operation, in accordance with 10 CFR 54.21(c)(1)(i).

A.4.5 OTHER PLANT-SPECIFIC TLAAS

A.4.5.1 Reactor Building, Turbine Building, and Heater Bay Crane Load Cycles

The reactor building, turbine building and heater bay cranes at Oyster Creek were designed to meet or exceed the design criteria of the Crane Manufacturers Association of America (CMAA) Specification 70, “Specifications for Electric Overhead Traveling Cranes,“ Class A1. These cranes are capable of a minimum of 20,000 cycles at rated capacity.

The load cycle design of these Oyster Creek cranes have been evaluated and remain valid for the period of extended operation, in accordance with 10 CFR 54.21(c)(1)(i).

A.4.5.2 Drywell Corrosion

Analysis of the minimum wall thickness of the containment vessel is a TLAA. The aging effects will be managed by the ASME Section XI, Subsection IWE aging management program, in accordance with the requirements of 10 CFR 54.21(c)(1)(iii), augmented by activities described in UFSAR Section A.1.27.

A.4.5.3 Equipment Pool and Reactor Cavity Walls Rebar Corrosion

Corrosion of reinforcing bar in localized areas of the reactor cavity and equipment pool walls was suspected as a result of observed rust in and around cracks in the walls between elevation 95' and 119'. To assess the condition of the reinforcing bars, concrete core samples were taken in 1988 and chemically analyzed to determine if water intrusion into concrete cracks created an environment that is aggressive to rebar. These analyses showed that the environment is not aggressive and thus corrosion should not be significant.

However because of the observed rust like substance in and around the cracks, the affected rebar were conservatively assumed to be subject to corrosion of 0.020 inches all around the rebar during the current term. Engineering analysis concluded the corrosion amount of reinforcing bars would not impact structural integrity of the affected walls during the current period of operation.

For the period of extended operation, corrosion of the reinforcing bars and the rate at corrosion is a TLAA. Although there is no evidence of continuing rebar corrosion, Exelon is conservatively assuming additional corrosion of 0.010 inches all around the rebar during the period of extended operation. Corrosion of the reinforcing bar has been projected to the end of the extended period in accordance with 10 CFR 54.21(c)(1)(ii), and determined that the intended function of the drywell shield wall and the equipment pool wall will be maintained through the period of extended operation.

A.4.5.4 Reactor Vessel Weld Flaw Evaluations

Flaws evaluated in 2000 as part of the 2000 ISI inspections were based on conditions valid for the current life of the plant, including fluence at 32 EFPY, thermal transients, and existing P-T curves. These flaws were evaluated in accordance with ASME Section XI, IWB-3600 for the period of extended operation. These flaws have been reevaluated for 50 EFPY conditions in accordance with 10 CFR 54.21(c)(1)(ii) and found to be acceptable for the period of extended operation.

A.4.5.5CRD Stub Flaw Evaluation

As part of the weld repair project for the CRD stubs during the construction phase of the plant, an evaluation of a postulated residual flaw was performed. The analysis of the postulated undetected flaw states that it would require more than 1000 startup and shutdown cycles to propagate the flaw to the surface, potentially leading to coolant leakage. The projected number of startup and shutdown cycles at the end of the period of extended operation is less than 275. Therefore the flaw evaluation is valid for the period of extended operation.

This flaw evaluation have been reevaluated for 60 years of operation in accordance with 10 CFR 54.21(c)(1)(ii) and found to be acceptable for the period of extended operation.

A.5 LICENSE RENEWAL COMMITMENT LIST

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
1) ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD	Existing program is credited. For the isolation condensers this program also includes enhancement activities identified in NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," lines IV.C1-5 and IV.C1-6. These enhancement activities consist of: 1. Temperature and radioactivity monitoring of the shell-side (cooling) water, which will be implemented prior to the period of extended operation. 2. Eddy current testing of the tubes, with inspection (VT or UT) of the tubesheet and channel head, which will be performed during the first ten years of the extended period of operation.	A.1.1	Prior to the period of extended operation	Section B.1.1
2) Water Chemistry	Existing program is credited.	A.1.2	Ongoing	Section B.1.2
3) Reactor Head Closure Studs	Existing program is credited.	A.1.3	Ongoing	Section B.1.3
4) BWR Vessel ID Attachment Welds	Existing program is credited.	A.1.4	Ongoing	Section B.1.4
5) BWR Feedwater Nozzle	Existing program is credited. The Oyster Creek Feedwater Nozzle aging management program will be enhanced to implement the recommendations of the BWR Owners Group Licensing Topical Report General Electric (GE) NE-523-A71-0594-A, Revision 1.	A.1.5	Prior to the period of extended operation	Section B.1.5 Letter 2130-06-20354

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
6) BWR Control Rod Drive Return Line Nozzle	Existing program is credited.	A.1.6	Ongoing	Section B.1.6
7) BWR Stress Corrosion Cracking	Existing program is credited. The program will be enhanced to add the following requirement to the Line Specifications for all applicable license renewal systems: “All new and replacement SS materials be low-carbon grades of SS with carbon content limited to 0.035 wt. % maximum and ferrite content limited to 7.5% minimum.”	A.1.7	Prior to the period of extended operation	Section B.1.7 Letter 2130-06-20354
8) BWR Penetrations	Existing program is credited.	A.1.8	Ongoing	Section B.1.8
9) BWR Vessel Internals	Existing program is credited. The program will be enhanced to include: 1. Inspection of the steam dryer in accordance with BWRVIP-139. 2. Inspection of the top guide as recommended in NUREG-1801. 3. Rolling of the CRD stub tubes as a permanent repair, once the NRC approves the ASME code case (Code Case N-730). If Code Case N-730 is not approved, Oyster Creek will develop a permanent ASME code repair plan. This permanent ASME code repair could be performed in accordance with BWRVIP-58-A, which has been approved by the NRC, or an alternate ASME code repair plan that would be submitted for prior NRC approval. If it is determined that the repair plan needs prior NRC approval, Oyster Creek will submit	A.1.9	Prior to the period of extended operation	Section B.1.9 Letter 2130-06-20354

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
	the repair plan two years before entering the period of extended operation. After the implementation of an approved permanent roll repair, if there is a leak in a CRD stub tube, Oyster Creek will weld repair any leaking CRD stub tubes during the extended period of operation by implementing a permanent NRC approved ASME Code repair for leaking stub tubes that cannot be made leak tight using a roll expansion method, prior to restarting the plant. 4. Oyster Creek will revise its Reactor internals program to also manage the aging effect of loss of material due to the aging mechanisms of pitting and crevice corrosion for Reactor Internals. 5. Oyster Creek will comply with all the applicable requirements that will be specified in the staff's final safety evaluations (SEs) of the BWRVIP-76 and BWRVIP-104 reports, and that it will complete all the license renewal action items in the final SE applicable to Oyster Creek, when they are issued. 6. The Reactor Internals program will be enhanced to include inspection for loss of material for the feedwater sparger, steam separator, RPV surveillance capsule holders and baffle plate. 7. The Reactor Internals Program will be enhanced to include and document the condition of the CRD and Feedwater Nozzle thermal sleeves to ensure future inspections look for thermal sleeve bypass flow. 8. Exelon is committed to following BWRVIP			

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
	guidelines • Oyster Creek will inform the (NRC) staff of any decision to not fully implement a BWRVIP guidelines approved by the staff within 45 days of the report • Oyster Creek will notify the staff if changes are made to the RPV and its internals' programs that affect the implementation of the BWRVIP report. • Oyster Creek will submit any deviation from the existing flaw evaluation guidelines that are specified in the BWRVIP report.			
10) Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS)	Program is new. The program will include a component specific evaluation of the loss of fracture toughness in accordance with the criteria specified in NUREG-1801, XI.M13. At least one year prior to the period of extended operation, the following information will be submitted to the NRC: 1) the type and composition of CASS reactor internal components within the scope of license renewal; and 2) the results of evaluations performed to determine susceptibility to thermal aging and neutron irradiation embrittlement. For those components where loss of fracture toughness may affect the intended function of the component, a supplemental inspection will be performed. This inspection will ensure the integrity of the CASS components exposed to the high temperature and neutron fluence present in the reactor environment.	A.1.10	Prior to the period of extended operation	Section B.1.10 Letter 2130-06-20358

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
11) Flow-Accelerated Corrosion	Existing program is credited.	A.1.11	Ongoing	Section B.1.11
12) Bolting Integrity	Existing program is credited. Program site implementing documents will be enhanced to include reference to EPRI TR-104213, Bolted Joint Maintenance & Application Guide, December 1995.	A.1.12	Prior to the period of extended operation	Section B.1.12 Letter 2130-06-20354
13) Open-Cycle Cooling Water System	Existing program is credited. The program will be enhanced as follows. Volumetric inspections, for piping that has been replaced, will be included at a minimum of 4 aboveground locations every 4 years. Inspection of heat exchangers will specify examination for loss of material due to general, pitting, crevice, galvanic and microbiologically influenced corrosion in the RBCCW, TBCCW and Containment Spray preventative maintenance tasks.	A.1.13	Prior to the period of extended operation	Section B.1.13
14) Closed-Cycle Cooling Water System	Existing program is credited.	A.1.14	Ongoing	Section B.1.14
15) Boraflex Monitoring	Existing program is credited.	A.1.15	Ongoing	Section B.1.15
16) Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems	Existing program is credited. The scope of the program will be increased to include additional hoists that have been identified as a potential Seismic II/I concern and are in scope for 10CFR54.4(a)(2). The program will also be enhanced to include inspections for rail wear, and loss of material due to corrosion, of cranes and hoists structural components, including the	A.1.16	Prior to the period of extended operation	Section B.1.16

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
	bridge, the trolley, bolting, lifting devices, and the rail system.			
17) Compressed Air Monitoring	Existing program is credited.	A.1.17	Ongoing	Section B.1.17
18) BWR Reactor Water Cleanup System	Existing program is credited. Based on Generic Letter 89-10 containment isolation valve upgrades/enhancements, an effective Hydrogen Water Chemistry program, and the complete lack of cracking found during any of the RWCU piping weld inspections performed under Generic Letter 88-01, all inspection requirements for the portion of the RWCU System outboard of the second containment isolation valves have been eliminated.	A.1.18	Ongoing	Section B.1.18
19) Fire Protection	Existing program is credited. The program will be enhanced to include: 1. Specific fuel supply inspection criteria for fire pumps during tests. 2. Inspection of external surfaces of the halon and carbon dioxide fire suppression systems. 3. Additional inspection criteria for degradation of fire barrier walls, ceilings, and floors. 4. Clearance inspection of in-scope fire doors every two years.	A.1.19	Prior to the period of extended operation	Section B.1.19 Letter 2130-06-20354
20) Fire Water System	Existing program is credited. The program will be enhanced to include: 1. Sprinkler head testing in accordance with NFPA 25, “Inspection, Testing and Maintenance of Water-Based Fire Protection Systems.” Samples will be submitted to a testing laboratory prior to being in	A.1.20	Prior to the period of extended operation	Section B.1.20

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
	service 50 years. This testing will be repeated at intervals not exceeding 10 years. 2. Water sampling for the presence of MIC at an interval not to exceed 5 years. 3. Periodic non-intrusive wall thickness measurements of selected portions of the fire water system at an interval not to exceed every 10 years. 4. Visual inspection of the redundant fire water storage tank heater (tank pressure retaining surfaces) during tank internal inspections.			Commitment Change 09-007
21) Aboveground Outdoor Tanks	Program is new. The program will manage the corrosion of outdoor carbon steel and aluminum tanks. The program credits the application of paint, sealant, and coatings as a corrosion preventive measure and performs periodic visual inspections to monitor degradation of the paint, sealant, and coatings and any resulting metal degradation of carbon steel or of the unpainted aluminum tank. Bottom UTs are performed on tank bottoms supported by soil or concrete.	A.1.21	Prior to the period of extended operation	Section B.1.21 Letter 2130-06-20354
22) Fuel Oil Chemistry	Existing program is credited. The program will be enhanced to include: 1. Routine analysis for particulate contamination using modified ASTM D 2276-00 Method A on fuel oil samples from the Emergency Diesel Generator Fuel Storage Tank, the Fire Pond Diesel Fuel Tanks, and the Main Fuel Oil Tank. 2. Analysis for particulate contamination using	A.1.22	Prior to the period of extended operation	Section B.1.22

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
	modified ASTM D 2276-00 Method A on new fuel oil. 3. Analysis for water and sediment using ASTM D 2709-96 for Fire Pond Diesel Fuel Tank bottom samples. 4. Analysis for bacteria to verify the effectiveness of biocide addition in the Emergency Diesel Generator Fuel Storage Tank, the Fire Pond Diesel Fuel Tanks, and the Main Fuel Oil Tank. 5. Periodic draining, cleaning, and inspection of the Fire Pond Diesel Fuel Tanks and the Main Fuel Oil Tank. Inspection activities will include the use of ultrasonic techniques for determining tank bottom thicknesses should there be any evidence of corrosion or pitting. As an alternative to draining, cleaning and inspecting the Fire Pond Diesel Fuel Tanks, these tanks may be replaced to ensure tank wall thickness is maintained and minimize the introduction of foreign material into the fuel oil system. Any replacement tanks will be procured to the appropriate internal cleanliness standards. 6. One time internal inspection of the Emergency Diesel Generator fuel oil day tanks prior to the period of extended operation to confirm the absence of aging effects.			Letter 2130-06-20354 Commitment Change 09-006
23) Reactor Vessel Surveillance	Existing program is credited. The program will be enhanced to implement BWRVIP-116 “BWR Vessel and Internals Project Integrated Surveillance Program	A.1.23	Prior to the period of extended operation	Section B.1.23

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
	(ISP) Implementation for License Renewal," including the conditions specified by the NRC in its Safety Evaluation dated February 24, 2006. If the Oyster Creek standby capsule is removed from the RPV without the intent to test it, the capsule will be stored in a manner that maintains it in a condition which would permit its future use, including during the period of extended operation, if necessary.			Letter 2130-06-20358 Letter 2130-06-20354
24) One-Time Inspection	Program is new. The One-Time Inspection program will provide reasonable assurance that an aging effect is not occurring, or that the aging effect is occurring slowly enough to not affect the component or structure intended function during the period of extended operation, and therefore will not require additional aging management. This program will be used for the following: 1. To confirm crack initiation and growth due to stress corrosion cracking (SCC), intergranular stress corrosion cracking (IGSCC), or thermal and mechanical loading is not occurring in Class 1 piping less than four-inch nominal pipe size (NPS) exposed to reactor coolant. Inspections will include UT examination of 10% of the total small bore Class I butt welds and destructive or non-destructive examination of a single small bore Class I socket welded connection. 2. To confirm the effectiveness of the Water	A.1.24	Prior to the period of extended operation Perform prior to the period of extended operation Perform prior to the	Section B.1.24 Letter 2130-06-20354

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
	Chemistry program to manage the loss of material and crack initiation and growth aging effects. Included in the scope of this activity, a one-time UT inspection of the “B” Isolation Condenser shell below the waterline will be conducted looking for pitting corrosion. 3. To confirm the effectiveness of the Closed Cycle Cooling Water System program to manage the loss of material aging effect. 4. To confirm the effectiveness of the Fuel Oil Chemistry program and Lubricating Oil Monitoring Activities program to manage the loss of material aging effect. 5. To confirm loss of material in stainless steel piping, piping components, and piping elements is insignificant in an intermittent condensation (internal) environment. 6. To confirm loss of material in steel piping, piping components, and piping elements is insignificant in an indoor air (internal) environment. 7. To confirm loss of material is insignificant for non-safety related (NSR) piping, piping components, and piping elements of vents and drains, floor and equipment drains, and other systems and components that could contain a fluid, and, are in scope for 10CFR54.4(a)(2) for spatial interaction. The scope of the program consists of only those systems not covered by other aging management activities.		period of extended operation	

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
	8. Two stainless steel pipe sections in a stagnant or low flow area in the Reactor Water Cleanup System, and two stainless steel pipe sections in a stagnant or low flow area in the Isolation Condenser System will be included in the one-time inspection samples for stress corrosion cracking.		Incorporate into program prior to period of extended operation	
25) Selective Leaching of Materials	Program is new. The Selective Leaching of Materials program will consist of inspections of a representative selection of components of the different susceptible materials to determine if loss of material due to selective leaching is occurring. Visual inspections will be consistent with ASME Section XI VT-1 visual inspection requirements and supplemented by hardness tests and other examinations of the selected set of components. If selective leaching is found, the condition will be evaluated to determine the need to expand inspections.	A.1.25	Prior to the period of extended operation	Section B.1.25
26) Buried Piping Inspection	Existing program is credited. The program will be enhanced to include: 1. Inspection of buried piping within ten years of entering the period of extended operation, unless an opportunistic inspection occurs within this ten-year period. The inspections will include at least one carbon steel, one aluminum and one cast iron pipe or component. In addition, for each of these materials, the locations selected for inspection will include at least one location where the pipe or component has not been previously replaced or	A.1.26	Prior to the period of extended operation	Section B.1.26 Letter 2130-06-20354

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
	recoated, if any such locations remain. 2. Fire protection components in the scope of the program. 3. Piping located inside the vault in the scope of the program. The vault is considered a manhole that is located between the reactor building and the exhaust tunnel.			
27) ASME Section XI, Subsection IWE	Existing program is credited. The program will be enhanced to include: 1. Ultrasonic Testing (UT) thickness measurements of the drywell shell in the sand bed region will be performed on a frequency of every 10 years , except that the initial inspection will occur prior to the period of extended operation and the subsequent inspection will occur two refueling outages after the initial inspection, to provide early confirmation that corrosion has been arrested. The UT measurements will be taken from the inside of the drywell at the same locations where UT measurements were performed in 1996. The inspection results will be compared to previous results. Statistically significant deviations from the 1992, 1994, and 1996 UT results will result in corrective actions that include the following: • Perform additional UT measurements to confirm the readings.	A.1.27	Prior to the period of extended operation 1. Prior to the period of extended operation (completed during 2006 and 2008 refueling outages); then every other refueling outage thereafter	Section B.1.27 Letter 2130-06-20354 Letter 2130-06-20358 Letter 2130-07-20464

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	• Notify NRC within 48 hours of confirmation of the identified condition. • Conduct visual inspection of the external surface in the sand bed region in areas where any unexpected corrosion may be detected. • Perform engineering evaluation to assess the extent of condition and to determine if additional inspections are required to assure drywell integrity. • Perform operability determination and justification for operation until next inspection. These actions will be completed prior to restart from the associated outage. Note: The frequency for the inspections described in commitment 1 (above) has been changed to every other refueling outage, in accordance with commitment 21 of the IWE Inspection Program. 2. A strippable coating will be applied to the reactor cavity liner to prevent water intrusion into the gap between the drywell shield wall and the drywell shell during periods when the reactor cavity is flooded. 3. The reactor cavity seal leakage trough drains and the drywell sand bed region drains will be monitored for leakage. • The sand bed region drains will be monitored daily during refueling		2. Prior to filling the reactor cavity with water 3. Periodically Daily during refueling outages	

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	outages. If leakage is detected, procedures will be in place to determine the source of leakage and investigate and address the impact of leakage on the drywell shell, including verification of the condition of the drywell shell coating and moisture barrier (seal) in the sand bed region and performance of UT examinations of the shell in the upper regions. UTs will also be performed on any areas in the sand bed region where visual inspection indicates the coating is damaged and corrosion has occurred. UT results will be evaluated per the existing program. Any degraded coating or moisture barrier will be repaired. These actions will be completed prior to exiting the associated outage. • The sand bed region drains will be monitored quarterly during the plant operating cycle. If leakage is identified, the source of water will be investigated, corrective actions taken or planned as appropriate. In addition, if leakage is detected, the following items will be performed during the next refueling outage: • Inspection of the drywell shell coating and moisture barrier (seal) in		Quarterly during non-outage periods	

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	the affected bays in the sand bed region • UTs of the upper drywell region consistent with the existing program • UTs will be performed on any areas in the sand bed region where visual inspection indicates the coating is damaged and corrosion has occurred • UT results will be evaluated per the existing program Any degraded coating or moisture barrier will be repaired. 4. Prior to the period of extended operation, Exelon will perform additional visual inspections of the epoxy coating that was applied to the exterior surface of the Drywell shell in the sand bed region, such that the coated surfaces in all 10 Drywell bays will have been inspected at least once. In addition, the Inservice Inspection (ISI) Program will be enhanced to require inspection of 100% of the epoxy coating every 10 years during the period of extended operation. These inspections will be performed in accordance with ASME Section XI, Subsection IWE. Performance of the inspections will be staggered such that at least three bays will be examined every other refueling outage.		4. Prior to the period of extended operation (completed during 2006 and 2008 refueling outages); then every other refueling outage thereafter	

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	Note: The scope and frequency for the inspections described in commitment 4 (above) has been changed to all 10 bays every other refueling outage, in accordance with commitment 21 of the IWE Inspection Program. 5. A visual examination of the drywell shell in the drywell floor inspection access trenches will be performed to assure that the drywell shell remains intact. If degradation is identified, the drywell shell condition will be evaluated and corrective actions taken as necessary. In addition, one-time ultrasonic testing (UT) measurements will be taken to confirm the adequacy of the shell thickness in these areas. Beyond these examinations, these surfaces will either be inspected as part of the scope of the ASME Section XI, Subsection IWE inspection program or they will be restored to the original design configuration using concrete or other suitable material to prevent moisture collection in these areas. Note: Commitment 5 (above) is supplemented by commitments 16 and 20 of the IWE Inspection Program. 6. The coating inside the torus will be visually inspected in accordance with ASME Section XI, Subsection IWE, per the Protective Coatings		5. Prior to the period of extended operation (completed during 2006 refueling outage). See commitments 16 and 20 for ongoing activities. 6. Every other refueling outage prior to (completed	Letter 2130-06-20426

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	Program. The scope of each of these inspections will include the wetted area of all 20 torus bays. Should the current torus coating system be replaced, the inspection frequency and scope will, as a minimum, meet the requirements of ASME Section XI, Subsection IWE.		during 2006 refueling outage) and during the period of extended operation	
	7. Exelon will conduct UT thickness measurements in the upper regions of the drywell shell every other refueling outage at the same locations as are currently measured.		7. Every other refueling outage prior to (completed during 2006 and 2008 refueling outages) and during the period of extended operation	
	8. The IWE Program will be credited for managing corrosion in the Torus Vent Line and Vent Header exposed to an Indoor Air (External) environment.			
	9. During the next UT inspections to be performed on the drywell sand bed region (reference AmerGen 4/4/06 letter to NRC), an attempt will be made to locate and evaluate some of the locally thinned areas identified in the 1992 inspection from the exterior of the drywell. This testing will be performed using the latest UT methodology with existing shell paint in place. The UT thickness measurements for these locally thinned areas may be taken from either inside the drywell or outside the drywell (sand bed region) to limit radiation dose to		9. Prior to the period of extended operation (completed during 2006 and 2008 refueling outages); then every other refueling outage thereafter	

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	as low as reasonably achievable (ALARA). Note: Commitment 9 (above) is supplemented by commitments 14 and 21 of the IWE Inspection Program.			
	10. Exelon will conduct UT thickness measurements on the 0.770 inch thick plate at the junction between the 0.770 inch thick and 1.154 inch thick plates, in the lower portion of the spherical region of the drywell shell. These measurements will be taken at four locations using the 6"x6" grid. The specific locations to be selected will consider previous operational experience (i.e., will be biased toward areas that have had corrosion or leakage). These measurements will be performed prior to the period of extended operation and repeated at the second refueling outage after the initial inspection, at the same location. If corrosion in this transition area is greater than areas monitored in the upper drywell, UT inspections in the transition area will be performed on the same frequency as those in the upper drywell (every other refueling outage).		10. Prior to the period of extended operation (completed in 2006 and 2008 refueling outages) and two refueling outages later	
	11. Exelon will conduct UT thickness measurements in the drywell shell "knuckle" area, on the 0.640 inch thick plate above the weld to the 2.625 inch thick plate. These measurements will be taken at four locations using the 6"x6" grid. The specific locations		11. Prior to the period of extended operation (completed in 2006 and 2008 refueling	

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	to be selected will consider previous operational experience (i.e., will be biased toward areas that have had corrosion or leakage). These measurements will be performed prior to the period of extended operation and repeated at the second refueling outage after the initial inspection, at the same location. If corrosion in this transition area is greater than areas monitored in the upper drywell, UT inspections in the transition area will be performed on the same frequency as those in the upper drywell (every other refueling outage).		outages)and two refueling outages later	
	12. When the sand bed region drywell shell coating inspection is performed (item 27, commitments 4 and 21), the seal at the junction between the sand bed region concrete and the embedded drywell shell will be inspected per the Protective Coatings Program. Note: The frequency for the inspections described in commitment 12 (above) has been changed to every other refueling outage, in accordance with commitment 21 of the IWE Inspection Program.		12. Prior to the period of extended operation (completed during 2006 and 2008 refueling outages); then every other refueling outage thereafter	
	13. The reactor cavity concrete trough drain will be verified to be clear from blockage once per refueling cycle. Any identified issues will be addressed via the corrective action process.		13. Once per refueling cycle	

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	14. UT thickness measurements will be taken from outside the drywell in the sandbed region during the 2008 refueling outage on the locally thinned areas examined during the October 2006 refueling outage. The locally thinned areas are distributed both vertically and around the perimeter of the drywell in all ten bays such that potential corrosion of the drywell shell would be detected. Note: The frequency for the inspections described in commitment 14 (above) has been changed to every other refueling outage, in accordance with commitment 21 of the IWE Inspection Program. 15. Starting in 2010, drywell shell UT thickness measurements will be taken from outside the drywell in the sandbed region in two bays per outage, such that inspections will be performed in all 10 bays within a 10-year period. The two bays with the most locally thinned areas (bay #1 and bay #13) will be inspected in 2010. If the UT examinations yield unacceptable results, then the locally thinned areas in all 10 bays will be inspected in the refueling outage that the unacceptable results are identified. Note: The scope and frequency for the inspections described in commitment 15 (above) have been changed to all 10 bays every other refueling outage,		14. Completed during the 2008 refueling outage; will be performed every other refueling outage thereafter per commitment 21. 15. All 10 bays were inspected during the 2008 refueling outage and will be inspected every other refueling outage thereafter per commitment 21.	

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	in accordance with commitment 21 of the IWE Inspection Program.			
	16. Perform visual inspection of the drywell shell inside the trenches in bay #5 and bay #17 and take UT measurements inside these trenches in 2008 at the same locations examined in 2006. Repeat (both the UT and visual) inspections at refueling outages during the period of extended operation until the trenches are restored to the original design configuration using concrete or other suitable material to prevent moisture collection in these areas. Note: Commitment 16 (above) is supplemented by commitment 20 of the IWE Inspection Program.		16. Completed during the 2008 refueling outage. Will be performed during subsequent refueling outages until trenches are restored to original configuration	
	17. Perform visual inspection of the moisture barrier between the drywell shell and the concrete floor/curb, installed inside the drywell during the October 2006 refueling outage, in accordance with ASME Section XI, Subsection IWE during the period of extended operation.		17. In accordance with ASME Section XI, Subsection IWE	
	18. Exelon will perform a 3-D finite element structural analysis of the primary containment drywell shell using modern methods and current drywell shell thickness data to better quantify the margin that		18. Prior to the period of extended operation (Complete).	

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	exists above the Code required minimum for buckling. The analysis will include sensitivity studies to determine the degree to which uncertainties in the size of thinned areas affect Code margins. If the analysis determines that the drywell shell does not meet Code-specified safety factors (i.e., 2.0 for the refueling load case and 1.67 for the post-accident load case), the NRC will be notified in accordance with 10 CFR 50 requirements. 19. Exelon will perform an engineering study to investigate cost-effective replacement or repair options to eliminate or reduce reactor cavity liner leakage. 20. Exelon is committed to perform visual and UT inspections of the drywell shell in the inspection trenches in drywell bays 5 and 17 during the Oyster Creek 2008 refueling outage (see commitment 16 of Exelon's IWE Program (item 27), made in its letter 2130-06-20426). Exelon will extend this commitment and also perform these inspections during the 2010 refueling outage. In addition, Exelon will monitor the two trenches for the presence of water during refueling outages. Visual and UT inspections of the shell within the trenches will continue to be performed until no water is identified in the trenches for two consecutive refueling outages, at which time the trenches will be		19. Prior to the period of extended operation (Complete). 20. Every refueling outage until trenches are restored	

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	restored to their original design configuration (e.g., refilled with concrete) to minimize the risk of future corrosion. As required by license condition 2.C (12) of the renewed operating license, NRC approval must be received prior to restoring the trenches to their original design configuration. 21. Perform the full scope of drywell sand bed region inspections prior to the period of extended operation and then every other refueling outage thereafter. The full scope is defined as: • UT measurements from inside the drywell (commitment 1) • Visual inspections of the drywell external shell epoxy coating in all 10 bays (commitment 4) • Inspection of the seal at the junction between the sand bed region concrete and the embedded drywell shell (commitment 12) • UT measurements at the external locally thinned areas inspected in 2006 (commitments 9 and 14)		21. Completed during the 2008 refueling outage; will be performed every other refueling outage thereafter. If the analysis being performed under commitment 18 above establishes increased margin, or if ongoing inspections continue to demonstrate that drywell shell corrosion has been sufficiently arrested, the period between inspections may be increased to minimize personnel radiation exposure.	

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	22. Verify that the sand bed drain lines are clear from obstruction.		22. Every other refueling outage	
28) ASME Section XI, Subsection IWF	Existing program is credited. The scope of the program will be enhanced to include additional MC supports, and require inspection of the underwater supports for loss of material due to corrosion and loss of mechanical function and loss of preload on bolting by inspecting for missing, detached, or loosened bolts.	A.1.28	Prior to the period of extended operation	Section B.1.28
29) 10 CFR Part 50, Appendix J	Existing program is credited.	A.1.29	Ongoing	Section B.1.29
30) Masonry Wall Program	Existing program is credited. The Masonry Wall Program is part of the Structures Monitoring Program.	A.1.30	Ongoing	Section B.1.30
31) Structures Monitoring Program	Existing program is credited. The program includes elements of the Masonry Wall Program and the RG 1.127, Inspection of Water-Control Structures Associated With Nuclear Power Plants aging management program. The Structures Monitoring Program will be enhanced to include: 1. Buildings, structural components and commodities that are not in scope of maintenance rule but have been determined to be in the scope of license renewal. These include miscellaneous platforms, flood and secondary containment doors, penetration seals, sump liners, structural seals, and anchors and embedment. 2. Component supports, other than those in scope of	A.1.31	Prior to the period of extended operation	Section B.1.31 Letter 2130-06-20354

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	ASME XI, Subsection IWF. 3. Inspection of Oyster Creek external surfaces of mechanical components that are not covered by other programs, HVAC duct, damper housings, and HVAC closure bolting. The scope of this enhancement includes the Reactor Building Closed Cooling Water System carbon steel piping and piping elements located inside the Drywell since operating experience has shown an exposure to an environment conducive to corrosion during outages. Also, to confirm that there is no significant age related degradation occurring on the external carbon steel surfaces of the feedwater and main steam system located inside containment, one-time visual inspections of feedwater and main steam system piping inside the containment for loss of material due to corrosion will be performed. Inspection and acceptance criteria of the external surfaces will be the same as those specified for structural steel components and structural bolting. 4. The visual inspection of insulated surfaces will require the removal of insulation. Removal of insulation will be on a sampling basis that bounds insulation material type, susceptibility of insulated piping or component material to potential degradations that could result from being in contact with insulation, and system operating temperature. 5. Inspection of electrical panels and racks, junction boxes, instrument racks and panels, cable trays,			

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	offsite power structural components and their foundations, and anchorage. 6. Periodic sampling, testing, and analysis of ground water to confirm that the environment remains non-aggressive for buried reinforced concrete. 7. Periodic inspection of components submerged in salt water (Intake Structure and Canal, Dilution structure) and in the water of the fire pond dam, including trash racks at the Intake Structure and Canal. 8. Inspection of penetration seals, structural seals, and other elastomers for change in material properties. 9. Inspection of vibration isolators, associated with component supports other than those covered by ASME XI, Subsection IWF, for reduction or loss of isolation function. 10. The current inspection criteria will be revised to add loss of material, due to corrosion for steel components, and change in material properties, due to leaching of calcium hydroxide and aggressive chemical attack for reinforced concrete. Wooden piles and sheeting will be inspected for loss of material and change in material properties. 11. Periodic inspection of the Fire Pond Dam for loss of material and loss of form. 12. Inspection of Station Blackout System structures, structural components, and phase bus enclosure assemblies.			

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	13. Inspection of Forked River Combustion Turbine power plant external surfaces of mechanical components that are not covered by other programs, HVAC duct, damper housings, and HVAC closure bolting. Inspection and acceptance criteria of the external surfaces will be the same as those specified for structural steel components and structural bolting. 14. The program will be enhanced to include inspection of Meteorological Tower Structures. Inspection and acceptance criteria will be the same as those specified for other structures in the scope of the program. 15. The program will be enhanced to include inspection of exterior surfaces of piping and piping components associated with the Radio Communications system, located at the meteorological tower site, for loss of material due to corrosion. Inspection and acceptance criteria will be the same as those specified for other external surfaces of mechanical components. 16. The program will be enhanced to require visual inspection of external surfaces of mechanical steel components that are not covered by other programs for leakage from or onto external surfaces, worn, flaking, or oxide-coated surfaces, corrosion stains on thermal insulation, and protective coating degradation (cracking and flaking).			

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	17. The program will be enhanced to require performing a baseline inspection of submerged water control structures prior to entering the period of extended operation. A second inspection will be performed six years after this baseline inspection and a third inspection eight years after the second inspection. After each inspection, an evaluation will be performed to determine if identified degradation warrant more frequent inspections or corrective actions.			
32) RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants	Existing program is credited. The program is part of the Structures Monitoring Program. The RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants aging management program will be enhanced to include: 1. Monitoring of submerged structural components and trash racks. 2. Periodic inspection of components submerged in salt water (Intake Structure and Canal, Dilution structure) and in the water of the fire pond dam. 3. Periodic inspection of the Fire Pond Dam for loss of material and loss of form. 4. Inspection of steel components for loss of material, due to corrosion. 5. Inspection of wooden piles and sheeting for loss of material and change in material properties. 6. Parameters monitored will be enhanced to include change in material properties, due to leaching of	A.1.32	Prior to the period of extended operation	Section B.1.32 Letter 2130-06-20354

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	calcium hydroxide, and aggressive chemical attack. Submerged water control structures will be inspected under the Structural Monitoring Program as follows: A baseline inspection of submerged water control structures will be performed prior to entering the period of extended operation. A second inspection will be performed six years after this baseline inspection and a third inspection eight years after the second inspection. After each inspection, an evaluation will be performed to determine if identified degradation warrants more frequent inspection or corrective actions.			
33) Protective Coating Monitoring and Maintenance Program	Existing program is credited. The Oyster Creek Protective Coating Monitoring and Maintenance Program provides for aging management of Service Level I coatings inside the primary containment and Service Level II coatings for the external drywell shell in the area of the sand bed region. The program will be enhanced to include: 1. The inspection of Service Level I and Service Level II protective coatings that are credited for mitigating corrosion on interior surfaces of the Torus shell and vent system, and, on exterior surfaces of the Drywell shell in the area of the sandbed region, will be consistent with ASME Section XI, Subsection IWE requirements. 2. Additional visual inspections of the epoxy coating that was applied to the exterior surface of the drywell shell in the sand bed region, such that the	A.1.33	Prior to the period of extended operation	Section B.1.33 Letter 2130-06-20354

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	coated surfaces in all 10 drywell bays will have been inspected at least once prior to entering the period of extended operation. 3. The inspection of the drywell sandbed region epoxy coating as specified in commitment 21 of the ASME Section XI, Subsection IWE Containment Inspection Program (Item 27). 4. The inspection of all 20 torus bays at a frequency of every other refueling outage for the current coating system. Should the current coating system be replaced, the inspection frequency and scope will be re-evaluated. Inspection scope will, as a minimum, meet the requirements of ASME Section XI, Subsection IWE. 5. When the sand bed region drywell shell coating inspection is performed under the IWE Program (Item 27, commitment 21), the seal at the junction between the sand bed region concrete and the embedded drywell shell will be inspected per the Protective Coatings Program.			Commitment Change 09-001
34) Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Program is new. The program will be used to manage aging of non-EQ cables and connections during the period of extended operation. A representative sample of accessible cables and connections located in adverse localized environments will be visually inspected at least once every 10 years for indications of accelerated insulation aging.	A.1.34	Prior to the period of extended operation	Section B.1.34
35) Electrical Cables and Connections	Existing program is credited. The program will be enhanced to include:	A.1.35	Prior to the period of extended operation	Section B.1.35

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Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits	1. A review of the Reactor Building High Radiation Monitoring and Air Ejector Offgas Radiation Monitoring system calibration results for cable aging degradation before the period of extended operation and every 10 years thereafter. 2. A review of the LPRM/APRM and IRM system cable testing results for cable aging degradation before the period of extended operation and every 10 years thereafter.			
36) Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Program is new. The program manages the aging of inaccessible medium-voltage cables (2.4 kV, 4.16 kV, 13.8 kV and 34.5 kV) that feed equipment performing license renewal intended functions. These cables may at times be exposed to moisture and are subjected to system voltage for more than 25% of the time. Manholes, conduits and sumps associated with these cables will be inspected for water collection every 2 years and drained as required. In addition, the cable circuits will be tested using a proven test for detecting deterioration of the insulation system due to wetting, such as power factor or partial discharge, as described in EPRI TR-103834-P1-2, or other testing that is state-of-the-art at the time the test is performed. The cable circuits will be tested at an initial frequency of six years, after which the frequency will be evaluated and adjusted, based on test results; the period between tests shall not exceed 10 years. Results of cable tests will be trended. Trending will occur at the same frequency as cable testing. Inclusion of the 13.8 kV	A.1.36	Prior to the period of extended operation	Section B.1.36 Letter 2130-06-20354

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	system circuits in this program reflects the scope expansion of the Station Blackout System electrical commodities. Inclusion of the 34.5 kV system circuits in this program reflects the scope enhancement for reconciliation of this aging management program from the draft January 2005 GALL to the approved September 2005 GALL.			
37) Periodic Testing of Containment Spray Nozzles	Existing plant specific program is credited. Carbon steel piping upstream of the drywell and torus spray nozzles is subject to possible general corrosion. The periodic flow tests of drywell and torus spray nozzles address a concern that rust from the possible general corrosion may plug the spray nozzles. These periodic tests verify that the drywell and torus spray nozzles are free from plugging that could result from corrosion product buildup from upstream sources.	A.2.1	Ongoing	Section B.2.1
38) Lubricating Oil Monitoring Activities	Existing plant specific program is credited. The program manages loss of material, cracking, and fouling in lubricating oil heat exchangers, systems, and components in the scope of license renewal by monitoring physical and chemical properties in lubricating oil. Sampling, testing, and monitoring verify lubricating oil properties. Oil analysis permits identification of specific wear mechanisms, contamination, and oil degradation within operating machinery, and components of systems in scope for license renewal. The program will be enhanced to add surveillance for verification of flow through the Fire	A.2.2	Prior to the period of extended operation	Section B.2.2 Letter 2130-06-20354

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	Protection System diesel driven pump gearbox lubricating oil cooler. Exelon will enhance Oyster Creek Program B.2.2 to include sampling and measurement of flash point of diesel engine lubricating oil to detect contamination of lubricating oil by fuel oil.			
39) Generator Stator Water Chemistry Activities	Existing plant specific program is credited. The program manages loss of material aging effects by monitoring and controlling water chemistry. Generator stator water chemistry control maintains high purity water in accordance with General Electric and EPRI guidelines for stator cooling water systems.	A.2.3	Ongoing	Section B.2.3
40) Periodic Inspection of Ventilation Systems	Existing plant specific program is credited. The program includes internal and external surface inspections of ventilation system components for indications of loss of material, such as rust, corrosion and pitting. Heat transfer surfaces are inspected for fouling. Flexible connection and door seal elastomer materials are inspected for detrimental changes in material properties, as evidenced by cracking, perforations in the material or leakage. The program will be enhanced to include duct exposed to soil, instrument piping and valves, restricting orifices and flow elements, and thermowells. The activities will also be enhanced to include inspection guidance for	A.2.4	Prior to the period of extended operation	Section B.2.4

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	detection of the applicable aging effects.			
41) Periodic Inspection Program	Plant specific program is new. The program includes systems in the scope of license renewal that require periodic monitoring of aging effects, and are not covered by other existing periodic monitoring programs. Activities consist of a periodic inspection of selected systems and components to verify integrity and confirm the absence of identified aging effects. The inspections are condition monitoring examinations intended to assure that existing environmental conditions are not causing material degradation that could result in a loss of system intended functions.	A.2.5	Prior to the period of extended operation	Section B.2.5
42) Wooden Utility Pole Program	Plant specific program is new. The program is used to manage loss of material and change of material properties for wooden utility poles in or near the Oyster Creek Substation that provide structural support for the conductors connecting the Offsite Power System and the 480/208/120V Utility (JCP&L) Non-Vital Power System to the Oyster Creek plant. The program consists of inspection on a 10-year interval by a qualified inspector. The wooden poles are inspected for loss of material due to ant, insect, and moisture damage and for change in material properties due to moisture damage.	A.2.6	Prior to the period of extended operation	Section B.2.6
43) Periodic Monitoring of Combustion Turbine Power Plant - Electrical	A new plant specific program is credited. The program will be used in conjunction with the existing Structures Monitoring Program, the new Inaccessible Medium Voltage Cables Not Subject to 10CFR50.49 Environmental Qualification Requirements program	A.1.37	Prior to the period of extended operation	Section B.1.37 Letter 2130-06-20354

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	and the new Electrical Cable Connections Not Subject to 10CFR 50.49 Environmental Qualification Requirements program to manage aging effects for the electrical commodities that support FRCT operation. The Program consists of visual inspections of accessible electrical cables and connections exposed in enclosures, pits, manholes and pipe trench; visual inspection for water collection in manholes, pits, and trenches, located on the FRCT site, for inaccessible medium voltage cables; and visual inspection of accessible phase bus and connections and phase bus insulators/supports; and visual inspection of high voltage insulators above 34.5 kV for salt build-up. The new program will be performed on a twice per year frequency for high voltage insulator inspections; on a 2-year interval for manhole, pit and trench inspections, on a 5-year frequency for phase bus inspections, and on a 10-year interval for cable and connection inspections.			
44) Metal Fatigue of Reactor Coolant Pressure Boundary	Existing program is credited. The program will be enhanced to use the EPRI-licensed FatiguePro cycle counting and fatigue usage factor tracking computer program. The computer program provides for calculation of stress cycles and fatigue usage factors from operating cycles, automated counting of fatigue stress cycles and automated calculation and tracking of fatigue cumulative usage factors. The program will also be enhanced to provide for calculating and tracking of the cumulative usage factors for bounding locations for the reactor pressure vessel, Class I piping,	A.3.1	Prior to the period of extended operation	Section B.3.1 Letter 2130-06-20354

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	the torus, torus vents, torus attached piping and penetrations, and the isolation condenser. Exelon will revise the Oyster Creek UFSAR to update the current licensing basis to reflect that a cumulative usage factor of 1.0 will be used in fatigue analysis for reactor coolant pressure boundary components, as endorsed by the NRC in 10 CFR 50.55a. Certification by a Professional Engineer of the reactor vessel design specification and design reports prepared for the fatigue activities associated with the Oyster Creek License Renewal Application will be performed.		Prior to the period of extended operation Prior to the period of extended operation	
45) Environmental Qualification (EQ) Program	Existing program is credited. EQ components that cannot be qualified for 60-years will be replaced before the end of their qualified life.	A.3.2	Ongoing	Section B.3.2
46) New P-T curves	Revised pressure-temperature (P-T) limits for a 60-year licensed operating life have been prepared and will be submitted to the NRC for approval.	A.4.1.3	Prior to the period of extended operation	Section 4.2.3
47) Circumferential Weld Exam Relief	Apply for extension Reactor Vessel Circumferential Weld Examination Relief for 60-year operation	A.4.1.4	Prior to the period of extended operation	Section 4.2.4
48) Axial weld Exam Relief	If essentially 100% coverage cannot be achieved when performing Reactor Vessel Axial Weld examinations, Oyster Creek Nuclear Generating Station will apply for relief from or for an alternative to ASME Code Section XI requirements, pursuant to 10 CFR 50.55a. This will be done as part of the Inservice Inspection Program on an interval-by-interval basis as required by the Code.	A.4.1.5	As required by 10 CFR 50.55a	Commitment Change Evaluation 08-004 Rev. 2

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49) Measure Drywell wall thickness	Drywell wall thickness will be monitored to ensure minimum wall thickness is maintained. The ASME Section XI, Subsection IWE aging management program, will manage the aging effects.	A.4.5.2	Ongoing	Section 4.7.2
50) Fluence Methodology	The NRC has issued a SER for RAMA approving RAMA for reactor vessel fluence calculations. Oyster Creek will comply with the applicable requirements of the SER.	A.4.1.1	Prior to the period of extended operation.	Section 4.2.1
51) Bolting Integrity - FRCT	The Bolting Integrity - FRCT aging management program is a new program that provides for condition monitoring of bolts and bolted joints within the scope of license renewal at the Forked River Combustion Turbine power plant. This program is based on the General Electric recommendations for proper bolting material selection, lubrication, preload application, installation and maintenance associated with the combustion turbine units and auxiliary systems. The program also includes periodic walkdown inspections for bolting degradation or bolted joint leakage at a frequency of at least once every four years. The program manages the loss of material and loss of preload aging effects. This new program will be implemented prior to entering the period of extended operation.	A.1.12A	Prior to the period of extended operation	Section B.1.12A Letter 2130-05-20228
52) Closed-Cycle Cooling Water System - FRCT	The Closed-Cycle Cooling Water System – FRCT aging management program is a new program that manages aging of piping, piping components, piping elements and heat exchangers that are included in the scope of license renewal for loss of material and	A.1.14A	Prior to the period of extended operation	Section B.1.14A Letter 2130-05-20228

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	cracking, and are exposed to a closed cooling water environment at the Forked River Combustion Turbine power plant. The Closed-Cycle Cooling Water System – FRCT aging management program relies on preventive measures to minimize corrosion by maintaining water chemistry control parameters and by performing system monitoring and maintenance inspection activities to confirm that the aging effects are adequately managed. Chemistry control, performance monitoring and inspection activities are based on industry-recognized guidelines of EPRI TR-107396, "Closed Cooling Water Chemistry Guidelines," for closed-cycle cooling water systems. Chemical control parameters will be monitored by annual water chemistry sampling. System operational monitoring activities will be performed at a frequency of at least once every six months. This new program will be implemented prior to entering the period of extended operation.			
53) Aboveground Steel Tanks - FRCT	The Above ground Steel Tanks - FRCT aging management program is a new program that will manage corrosion of aboveground outdoor steel tanks. Paint coating is a corrosion preventive measure, and periodic visual inspections will monitor degradation of the paint coating and any resulting metal degradation of tank external surfaces. The aboveground tanks external surfaces will be visually inspected for coating degradation by walkdown at least once every two	A.1.21A	Prior to the period of extended operation	Section B.1.21A Letter 2130-05-20228

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	years. The Main Fuel Oil tank bottom is in contact with concrete and soil, and is inaccessible for visual inspection. Therefore, the program includes periodic Non-destructive wall-thickness examinations of the Main Fuel Oil tank bottom to verify that significant corrosion is not occurring. This program, including the initial tank external paint inspections, will be implemented prior to the period of extended operation. The recommended UT inspection of the Main Fuel Oil tank bottom was performed in October 2000, so it is not necessary to perform this inspection again prior to entering the period of extended operation. Based on the results of the October 2000 inspections, and subsequent repairs to the tank floor, the tank was certified to be suitable for the storage of number 2 fuel oil for a period of time not to exceed 20 years from October 2000, before the next internal inspection would be necessary. Therefore, additional UT inspections will be performed prior to October 2020.			
54) Fuel Oil Chemistry – FRCT	The Fuel Oil Chemistry - FRCT aging management program is a new program that provides assurance that contaminants are maintained at acceptable levels in new and stored fuel oil for systems and components within the scope of Licensing Renewal. The Fuel Oil Storage Tank will be maintained by monitoring and controlling fuel oil contaminants in accordance with the guidelines of the American Society for Testing	A.1.22A	Prior to the period of extended operation	Section B.1.22A Letter 2130-05-20228

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	Materials (ASTM). Fuel oil sampling activities will be in accordance with ASTM D 4057 for multilevel and tank bottom sampling. Fuel oil will be periodically sampled and analyzed for particulate contamination in accordance with modified ASTM Standard D 2276 Method A or ASTM Standard D 6217, and, for the presence of water and sediment in accordance with ASTM Standard D 2709 or ASTM Standard D 1796. The Fuel Oil Storage Tank will be periodically drained of accumulated water and sediment and will be periodically drained, cleaned, and internally inspected. These activities effectively manage the effects of aging by providing reasonable assurance that potentially harmful contaminants are maintained at low concentrations. This new program will be implemented prior to entering the period of extended operation. The internal inspection of the Main Fuel Oil tank was performed in October 2000, so it is not necessary to perform this inspection again prior to entering the period of extended operation. Based on the results of the October 2000 inspections and repairs, the tank was certified to be suitable for the storage of number 2 fuel oil for a period of time not to exceed 20 years from October 2000, before the next internal inspection would be necessary. Therefore, additional internal inspections of the tank floor are not necessary prior to entering the period of extended operation and will be performed prior to October 2020.			

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55) One-Time Inspection - FRCT	The One-Time Inspection – FRCT program will provide measures to verify that an aging management program is not needed, confirms the effectiveness of existing activities, or determines that degradation is occurring which will require evaluation and corrective action. The program will be implemented prior to the period of extended operation. Inspection methods will include visual examination or volumetric examinations. Should aging effects be detected, the program will initiate actions to characterize the nature and extent of the aging effect and determines what subsequent monitoring is needed to ensure intended functions are maintained during the period of extended operation.	A.1.24A	Prior to the period of extended operation	Section B.1.24A Letter 2130-05-20228
56) Selective Leaching of Materials -FRCT	The Selective Leaching of Materials - FRCT aging management program is a new program that will consist of inspections of components constructed of susceptible materials to determine if loss of material due to selective leaching is occurring. For the FRCT power plant, these are limited to copper alloy materials exposed to a closed cooling water environment. One-time inspections will consist of visual inspections supplemented by hardness tests. If selective leaching is found, the condition will be evaluated to determine the ability of the component to perform its intended function until the end of the period of extended operation and for the need to expand inspections. This new program will be implemented in the time period	A.1.25A	This new program will be implemented in the time period after January 2018 and prior to January 2028	Section B.1.25A Letter 2130-05-20228

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	after January 2018 and prior to January 2028.			
57) Buried Piping Inspection – FRCT	The Buried Piping Inspection - FRCT aging management program is a new program that manages the external surface aging effects of loss of material for carbon steel piping and piping system components in a soil (external) environment. The program activities consist of preventive and condition-monitoring measures to manage the loss of material due to external corrosion for piping and piping system components in the scope of license renewal that are in a soil (external) environment. The program scope includes buried portions of glycol cooling water piping located at the Forked River Combustion Turbine station. External inspections of buried components will occur opportunistically when they are excavated during maintenance. Within 10 years prior to entering the period of extended operation, inspection of buried piping will be performed unless an opportunistic inspection occurs within this ten-year period. Upon entering the period of extended operation, inspection of buried piping will again be performed within the next ten years, unless an opportunistic inspection occurs during this ten-year period. This program will be implemented prior to entering the period of extended operation.	A.1.26A	Prior to the period of extended operation	Section B.1.26A Letter 2130-05-20228

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
58) Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components- FRCT	The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components - FRCT aging management program is a new program that consists of visual inspections of the internal surfaces of steel piping, valve bodies, ductwork, filter housings, fan housings, damper housings, mufflers and heat exchanger shells in the scope of license renewal at the Forked River Combustion Turbine power plant that are not covered by other aging management programs. Internal inspections will be performed during scheduled maintenance activities when the surfaces are made accessible for visual inspection. The program includes visual inspections to assure that existing environmental conditions are not causing material degradation that could result in a loss of component intended functions. These inspections will be performed during the major combustion turbine inspection outages and will be performed on a frequency of at least once every 10 years. The initial inspections associated with this program will be performed at the next major inspection outage for each unit. Based on an inspection frequency of 10 years, the next inspection for CT Unit 1 will be performed by May 2014, and the next inspection for CT Unit 2 will be performed by November 2015.	A.1.38	Inspection for CT Unit 1 will be performed by May 2014, and inspection for CT Unit 2 will be performed by November 2015	Section B.1.38 Letter 2130-05-20228
59) Lubricating Oil Analysis Program – FRCT	The Lubricating Oil Analysis Program – FRCT is a new program that includes measures to verify the oil environment in mechanical equipment is maintained to	A.1.39	Prior to the period of extended operation	Section B.1.39 Letter 2130-05-20228

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	the required quality. The Lubricating Oil Analysis Program – FRCT maintains oil systems contaminants (primarily water and particulates) within acceptable limits, thereby preserving an environment that is not conducive to loss of material, cracking, or reduction in heat transfer. Lubricating oil testing activities include sampling and analysis of lubricating oil for detrimental contaminants. The presence of water or particulates may also be indicative of inleakage and corrosion product buildup. The program will also include the measurement of flash point. This program is augmented by the One Time Inspection – FRCT (B.1.24A) program, to verify the effectiveness of the Lubricating Oil Analysis Program - FRCT. This new program will be implemented prior to the period of extended operation.			Letter 2130-06-20354
60) Periodic Inspection Program - FRCT	The Periodic Inspection Program - FRCT is a new program that will consist of periodic inspections of selected components to verify the integrity of the system and confirm the absence of identified aging effects. Inspections will be scheduled to coincide with major combustion turbine maintenance inspections, when the subject components are made accessible. These inspections will be performed on a frequency not to exceed once every 10 years. The purpose of the inspection is to determine if a specified aging effect is occurring. If the aging effect is occurring, an evaluation will be performed to determine the effect it will have on the ability of affected components to perform their	A.2.5A	Inspection for CT Unit 1 will be performed by May 2014, and inspection for CT Unit 2 will be performed by November 2015	Section B.2.5A Letter 2130-05-20228

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	intended functions for the period of extended operation, and appropriate corrective action is taken. Inspection methods may include visual examination, surface or volumetric examinations. When inspection results fail to meet established acceptance criteria, an evaluation will be conducted to identify actions or measures necessary to provide reasonable assurance that the component intended function is maintained during the period of extended operation. The initial inspections associated with this program will be performed at the next major inspection outage for each unit. Based on an inspection frequency of 10 years, the next inspection for CT Unit 1 will be performed by May 2014, and the next inspection for CT Unit 2 will be performed by November 2015.			
61) Buried Piping and Tank Inspection – Met Tower Repeater Engine Fuel Supply	The Buried Piping and Tank Inspection – Met Tower Repeater Engine Fuel Supply aging management program is a new program that manages the external surface aging effects of loss of material for copper and carbon steel piping, and carbon steel tanks in a soil (external) environment. The program activities consist of preventive and condition-monitoring measures to manage the loss of material due to external corrosion for piping and tanks in the scope of license renewal that are in a soil (external) environment. The program scope includes buried portions of the Met Tower based radio communications system repeater backup engine generator fuel (propane) supply piping and the associated buried fuel supply tank, located at the	A.1.26B	Prior to period of extended operation	Section B.1.26B Letter 2130-05-20239

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	Meteorological Tower. External inspections of buried components will occur opportunistically when they are excavated during maintenance. Within 10 years prior to entering the period of extended operation, inspection of buried piping will be performed unless an opportunistic inspection occurs within this ten-year period. Upon entering the period of extended operation, inspection of buried piping will again be performed within the next ten years, unless an opportunistic inspection occurs during this ten-year period. This program will be implemented prior to entering the period of extended operation.			
62)	Exelon will commit to perform monitoring of any leakage from the spent fuel pool liner via the pool leak chase piping.		Prior to the period of extended operation	GALL Reconciliation Letter 2130-06-20293
63)	Exelon will replace the previously un-replaced, buried safety-related ESW piping prior to the period of extended operation.		Prior to the period of extended operation	Letter 2130-06-20328

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64) Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	The Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements aging management program is a new program that will be used to manage the aging effects of metallic parts of non-EQ electrical cable connections within the scope of license renewal during the period of extended operation. A representative sample of non-EQ electrical cable connections will be selected for testing considering application (high, medium and low voltage), circuit loading and location, with respect to connection stressors. The type of test to be performed, i.e., thermography, is a proven test for detecting loose connections. A representative sample of non-EQ cable connections will be tested at least once every 10 years. This new program will be implemented prior to the period of extended operation.	A.1.40	Prior to the period of extended operation	Section B.1.40 Letter 2130-06-20354
65) Corrective Action, Confirmation and Administrative Controls for Forked River Combustion Turbine activities	Prior to the period of extended operation, Exelon will ensure that procedures are established to implement the program elements of Corrective Action, Confirmation, and Administrative Controls, as described in Sections A.0.5 and B.0.3 of Enclosure 1 of AmerGen letter 2130-06-20334, for the Forked River Combustion Turbine aging management activities.	A.0.5	Prior to the period of extended operation	B.0.3 Letter 2130-06-20334