

**Michael P. Gallagher, PE**  
Vice President  
License Renewal Projects

Telephone 610.765.5958  
www.exeloncorp.com  
michaelp.gallagher@exeloncorp.com

An Exelon Company

AmerGen  
200 Exelon Way  
KSA/2-E  
Kennett Square, PA 19348

10 CFR 50  
10 CFR 51  
10 CFR 54

2130-06-20345  
June 2, 2006

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555

Oyster Creek Generating Station  
Facility Operating License No. DPR-16  
NRC Docket No. 50-219

**Subject:** Supplemental Information Related to Oyster Creek Generating Station License Renewal Application (TAC No. MC7624)

**Reference:** AmerGen letter 2130-06-20327, dated May 9, 2006, "Response to NRC Request for Additional Information, dated April 20, 2006, Related to Oyster Creek Generating Station License Renewal Application (TAC No. MC7624)"

In the referenced letter, AmerGen Energy Company, LLC (AmerGen) provided additional information to the NRC related to Section 3.6.2 of the Oyster Creek Generating Station License Renewal Application (LRA). Following NRC staff review of this information, it was determined that additional clarifications were needed to the responses to RAIs 3.6.2.2.5, 3.6.2.2.6-1 and 3.6.2.3.3. Enclosure 1 provides these clarifications.

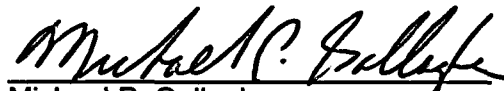
An updated Summary of Commitments table is included as Enclosure 2.

If you have any questions, please contact Fred Polaski, Manager License Renewal, at 610-765-5935.

I declare under penalty of perjury that the foregoing is true and correct.

Respectfully,

Executed on 06/02/06

  
Michael P. Gallagher  
Vice President, License Renewal  
AmerGen Energy Company, LLC

**Enclosures:** 1. Clarification of 5/9/06 Responses to RAIs 3.6.2.2.5, 3.6.2.2.6-1 and 3.6.2.3.3  
2. Summary of Commitments

A114

**U.S. Nuclear Regulatory Commission**

**June 2, 2006**

**Page 2 of 2**

**cc: Regional Administrator, USNRC Region I, w/o Enclosure  
USNRC Project Manager, NRR - License Renewal, Safety, w/Enclosure  
USNRC Project Manager, NRR - License Renewal, Environmental, w/o Enclosure  
USNRC Project Manager, NRR - OCGS, w/o Enclosure  
USNRC Senior Resident Inspector, OCGS, w/o Enclosure  
Bureau of Nuclear Engineering, NJDEP, w/Enclosure  
File No. 05040**

## **Enclosure 1**

### **Clarification of 5/9/2006 Responses to RAIs 3.6.2.2.5, 3.6.2.2.6-1, and 3.6.2.3.3 on OC LRA Section 3.6.2**

The responses to RAI questions 3.6.2.2.5, 3.6.2.2.6-1, and 3.6.2.3.3 have been updated and are provided in this Enclosure. New information provided since the May 09, 2006 AmerGen response to Request for Additional Information for the Review of Oyster Creek Generating Station, License Renewal Application, dated April 20, 2006 is shown in bolded and italicized font.

Appendix A to this Enclosure is a complete resubmittal of Appendix A to Enclosure 1 of the May 09, 2006 AmerGen response to the April 20, 2006 RAIs. New information in Appendix A to this Enclosure since the May 09, 2006 AmerGen response to the April 20, 2006 RAIs is also shown in bolded and italicized font. Additional information on the presentation of information in Appendix A is provided on page 1 of Appendix A.

#### RAI-3.6.2.2.5

Industry operating experience as discussed in Information Notice 93-95, identified the potential for loss of offsite power due to salt contamination of the switchyard insulators. On March 17, 1993, Crystal River Unit 3 experienced a loss of the 230 kV switchyard (normal offsite power to safety-related busses) when a light rain caused arcing across salt-laden 230 kV insulators and opened breakers in switchyard. Since 1982, Pilgrim station has also experienced several loss of offsite power events when heavy ocean storms deposited salt on the 345 kV switchyard causing the insulator to arc to ground. The applicant stated that an incident on September 18, 2003 was considered a highly unusual weather condition that resulted in wind blown salty spray deposited on insulators causing flashing. The fact that industry operating experience has shown that the potential loss of offsite power due to salt contamination of switchyard insulators does exist for facilities that are near the sea coast where salt spray is prevalent, the staff requests the applicant to provide an aging management program (AMP) to manage the aging effects of insulator surface contamination due to salt deposits.

#### Response:

For circuits within the scope of license renewal at voltages above 34.5 kV, Oyster Creek will implement visual inspections of high voltage insulators to manage the aging effects of salt build-up. The only circuits within the scope of license renewal that are in excess of 34.5 kV are on the high side of the transformers (Banks 9 and 10) that connect the Forked River Combustion Turbines to the 230 kV switchyard. High voltage insulators associated with these circuits will be included in this aging management program.

These inspections will be incorporated as a revision to the Periodic Monitoring of Combustion Turbine Power Plant – Electrical (B.1.37) aging management program. Inspections are to be performed using binoculars to a determined threshold for implementing corrective actions. Corrective actions include subsequent cleaning (i.e., washing) of a contaminated insulator. The visual inspections will be performed on a twice per year frequency, beginning prior to the period of extended operation.

This response represents a change in Oyster Creek's approach to evaluating and managing the aging effects of salt build-up on high voltage insulators. Several Oyster Creek LRA sections and portions of the 10/12/2005 response to RAI 2.5.1.19-1 on the Station Blackout System are impacted by this change in approach. These changes are primarily shown on pages 3 through 14 of Appendix A to Enclosure 1. Changes to *Oyster Creek* aging management review Tables 3.6.1 and 3.6.2.1.1 *from the LRA* are shown within the Tables on pages 23 through 32 of Appendix A to Enclosure 1. *Changes to Forked River Combustion Turbine aging management review Tables 3.6.1A and 3.6.2.1.2A from the AmerGen October 12, 2005 response to RAI 2.5.1.19-1 are shown within the Tables on pages 33 through 41 of Appendix A to Enclosure 1.*

A commitment to perform these inspections will be included in LRA Appendix A, Table A.5 as part of license renewal commitment #43.

**RAI-3.6.2.2.6-1**

**Torque relaxation for bolted connections is a concern for transmission conductor connections. An electrical connection must be designed to remain tight and maintain good conductivity through a large temperature range. Meeting this design requirement is difficult if the material specified for the bolt and the conductor are different and have different rates of thermal expansion. For example, copper or aluminum bus/conductor materials expand faster than most bolting materials. If thermal stress is added to stresses inherent at assembly, the joint members or fasteners can yield. If plastic deformation occurs during thermal loading (i.e., heatup) when the connection cools, the joint will be loose. EPRI document TR-104213, "Bolted Joint Maintenance & Application Guide" recommends inspection of bolted joints for evidence of overheating, signs of burning or discoloration, and indication of loose bolts. The staff requests the applicant to provide a discussion why torque relaxation for bolted connection is not a concern for Oyster Creek Generating Station (OCGS).**

**Response:**

At Oyster Creek, the types of locking hardware used for the transmission conductor connections include Belleville washers and lock washers for lugged connections. There are also U-bolt clamp type cable connections that utilize a plate to hold the cable within the U of the bolt. These connections either used a lock washer with the nuts or another type of crown shaped locking nut in addition to the regular nut. As stated in the Oyster Creek LRA, preload of bolted connections is maintained by the appropriate design and use of lock and Belleville washers that provide vibration absorption and prevent loss of preload. This design is identified in EPRI TR-104213, Section 6.9 as a way to maintain preload. In a recent walkdown of license renewal in-scope transmission conductor connections, it was observed that the Belleville and lock washers were fully compressed and the crown shaped nuts for the u-bolt clamps, were flush against the regular nut. There is no Oyster Creek operating experience indicating any occurrence of loosening of transmission conductor connections. The connections at switchyard equipment, transformers (including the in-scope start-up and station blackout transformers), the start-up transformer regulators and disconnect switches are also evaluated, **at least twice per year**, via thermography performed as preventive maintenance. There is no operating experience from this monitoring that indicates occurrences of loosening transmission conductor connections. Therefore, based on the design in accordance with EPRI TR-104213, periodic monitoring through existing preventative maintenance and no adverse Oyster Creek related operating experience, it is concluded that there are no additional evaluations or actions required to address the aging mechanism of torque relaxation for bolted connections for transmission conductors.

### RAI- 3.6.2.3.3

In LRA Section 3.6.2.3.3, under the heading "Thermal Cycling, Ohmic Heating and Electrical Transients," the applicant stated that "At Oyster Creek, power supply cables are typically installed in a continuous run from the supply, e.g., switchgear, to the load, e.g., motor. The metallic parts of connections to the supply and load are therefore part of, or internal to, active components, e.g., the switchgear and motor, and therefore not subject to aging management." The AMP XI-E6, "Electrical Cable Connections not Subject to 10 CFR 50.49 Environmental Qualification Requirements" of NUREG-1801, Rev. 1 specified that connections associated with cables within the scope of license renewal are part of this program, regardless of their association with active or passive components. Also, refer to pages 107, 256 and 257 of NUREG - 1833, "Technical Bases for Revision to the License Renewal Guidance Documents," for additional information regarding AMP XI-E6. The staff requests that the applicant provide an AMP with the ten elements.

#### Response:

Oyster Creek will develop and implement an aging management program that will manage the aging effects (i.e., loosening of metallic connections) of electrical connections, including those associated with active components. A representative sample of electrical connections will be tested. Sampling will be based on technical evaluation of the application (high, medium and low voltage), circuit loading, and location with respect to connection stressors. The program to be implemented will use thermography, on a 10-year frequency and will be implemented prior to the period of extended operation.

This response represents a change in Oyster Creek's approach to evaluating and managing the aging effects on electrical cable connections – metallic parts. Several Oyster Creek LRA sections *and portions of the AmerGen October 12, 2005 response to RAI 2.5.1.19-1 on the Station Blackout System* are impacted by this change in approach. These changes are shown on pages 15 through 22 of Appendix A to Enclosure 1. Changes to *Oyster Creek* aging management review Tables 3.6.1 and 3.6.2.1.1 *from the LRA* are shown within the Tables on pages 23 through 32 of Appendix A to Enclosure 1. *Changes to Forked River Combustion Turbine aging management review Tables 3.6.1A and 3.6.2.1.2A from the AmerGen October 12, 2005 response to RAI 2.5.1.19-1 are shown within the Tables on pages 33 through 41 of Appendix A to Enclosure 1.*

A commitment to implement this new aging management program will be included in LRA Appendix A, Table A.5 as new commitment #64.

## Enclosure 1 – Appendix A

### RAI Response Impacts on License Renewal Application

#### Oyster Creek Generating Station License Renewal Application (TAC No. MC7624)

This Enclosure 1, Appendix A is being resubmitted in its entirety, reflecting the clarifications summarized in Enclosure 1. Revisions from the AmerGen May 09, 2006 response to the April 20, 2006 RAIs are still highlighted as was previously done. Notes describing these highlights are throughout the contents of this appendix.

Changes as a result of this supplement are designated by text that is bolded and italicized.

Enclosure 1 - Appendix A

Description of Contents

	<u>Page Numbers</u>
<u>Changes Associated with RAI 3.6.2.2.5</u>	
Description of LRA <i>and</i> <b>RAI 2.5.1.19-1</b> Response Text Changes	<b>3-5</b>
<b>RAI 2.5.1.19-1</b> Appendix A Table A.5 Revisions	<b>6</b>
<b>RAI 2.5.1.19-1</b> Appendix A, Section A.1.37 Revisions	<b>7</b>
<b>RAI 2.5.1.19-1</b> Appendix B, Section B.1.37 Revisions	<b>8-14</b>
<u>Changes Associated with RAI 3.6.2.3.3</u>	
Description of LRA <i>and</i> <b>RAI 2.5.1.19-1</b> Response Text Changes	<b>15-16</b>
LRA Appendix A Table A.5 Revisions	<b>17</b>
Appendix A, Section A.1.40 Revisions	<b>18</b>
Appendix B, Section B.1.40 Revisions	<b>19-22</b>
<u>Changes Associated with RAIs 3.6.2.2.5 and 3.6.2.3.3</u>	
LRA Table 3.6.1 Revisions	<b>23-26</b>
LRA Table 3.6.2.1.1 Revisions	<b>27-32</b>
<b>RAI 2.5.1.19-1 Response Table 3.6.1A Revisions</b>	<b>33-36</b>
<b>RAI 2.5.1.19-1 Response Table 3.6.2.1.2A Revisions</b>	<b>37-41</b>



**LRA Text Changes and AmerGen October 12, 2005 Response to RAI 2.5.1.19-1 Text Changes Associated With RAI 3.6.2.2.5**

Note: Changes to previously submitted information and new information are designated by text bolding. Existing LRA text is identified by italics.

In Section 3.6.2.1.3 of the Oyster Creek LRA the sentence addressing "Aging Effects Requiring Management" is revised to read:

- The following aging effects associated with the High Voltage Insulators require aging management:**
- **Salt build-up on the insulator surface.**

The following is added as the first sentence of the Section addressing "Aging Management Programs:"

- The following aging management program manages the aging effects for the High Voltage Insulators:**
- **Periodic Monitoring of the Combustion Turbine Power Plant – Electrical.**

In Section 3.6.2.2.5 of the Oyster Creek LRA, several paragraphs are affected. The following is replacement text for the discussions following headers of

- Degradation of Insulator Quality due to Presence of Any Salt Deposits and Surface Contamination; and Loss of Material due to Mechanical Wear
- Salt Deposits, and
- Conclusions.

No changes are required for text following headers for

- Contamination
- Wear.

**Degradation of Insulator Quality due to Presence of Any Salt Deposits and Surface Contamination; and Loss of Material due to Mechanical Wear**

*Degradation of insulator quality due to presence of any salt deposits and surface contamination and loss of material due to mechanical wear caused by wind blowing on transmission conductors could occur in high voltage insulators. NUREG-1801 recommends further evaluation of a plant-specific aging management program to ensure that this aging effect is adequately managed.*

**For the reasons described below, Oyster Creek will manage the aging effect of salt build-up on the surface of High Voltage Insulators via the Periodic Monitoring of the Combustion Turbine Power Plant – Electrical aging management program. (B.1.37)**

*For the reasons described below, Oyster Creek requires no aging management activities associated with non-salt surface contamination or wear on high voltage insulators for the extended period of operation.*

#### **Salt Deposits**

*Arcing leading to loss of offsite power has occurred at power plants located on sea coasts. Prevention of the problem is possible with lubricants on the insulators and may be appropriate for plants that experience the problem relatively regularly.*

*Weather – related occurrences of arcing due to salt deposition leading to loss of offsite power have been documented in SOER 02-1, Severe Weather, and NRC IN 93- 95, Storm - Related Loss of Offsite Power Events Due to Salt Buildup on Switchyard Insulators.*

*On September 18, 2003, arcing was observed on 230kV insulators in the Oyster Creek Switchyard. The arcing was not severe enough to cause ground faults. No protective relaying was actuated (CAP No. O2003-1925). The observations made in the switchyard are consistent with salt spray on the insulators. This resulted from the unusual weather conditions experienced during the passing of hurricane Isabel. The high winds and waves resulted in wind blown salty spray being deposited on the insulators. The electrical conductivity of the salty moisture on the insulators caused the observed flashing. The subsequent rains washed the salt from the insulators and eliminated the problem. Oyster Creek has not experienced a repeat occurrence of this event and has not experienced any arcing leading to loss of offsite power events attributable to salt contamination.*

**AmerGen will include in its Periodic Monitoring of the Combustion Turbine Power Plant – Electrical aging management program visual inspection of in-scope high voltage insulators above 34.5 kV for salt build-up.**

#### **Conclusion**

**For these reasons, AmerGen will include in its Periodic Monitoring of the Combustion Turbine Power Plant – Electrical aging management program visual inspection of in-scope high voltage insulators above 34.5 kV for salt build-up. No aging management activities associated with non-salt surface contamination or wear on high voltage insulators are required for the extended period of operation of Oyster Creek.**

**In section 3.6.2.1.9 provided in Appendix C from the AmerGen October 12, 2005 response to RAI 2.5.1.19-1, the following should be added to the bullet list of "Aging Effects Requiring Management."**

- **Degradation of insulation quality/presence of any salt deposits**

**LRA Table 3.6.1, Summary of Aging Management Programs, line item 3.6.1-11 requires**

revision. **LRA Table 3.6.2.1.1, Electrical Commodity Groups, Summary of Aging Management Evaluation, information for the component type of high voltage insulators requires revision. A complete printout of these tables is provided at the end of this Appendix incorporating revisions for high voltage insulators and electrical cable connections – metallic parts.**

***The AmerGen October 12, 2005 response to RAI 2.5.1.19-1, Table 3.6.1A, Summary of Aging Management Evaluations for the Station Blackout System – Electrical, line item 3.6.1-11 requires revision. The AmerGen October 12, 2005 response to RAI 2.5.1.19-1, Table 3.6.2.1.2A, Station Blackout System – Electrical Commodities Summary of Aging Management Evaluation information for the component type of high voltage insulators requires revision. A complete printout of these tables is provided at the end of this appendix incorporating revisions for changes for high voltage insulators and electrical cable connections – metallic parts.***

An update to LRA Appendix A (Table A.5 commitment number 43 and new Section A.1.37) and Appendix B (new Section B.1.37 for the Periodic Monitoring of the Combustion Turbine Power Plant – Electrical) were submitted as part of the 10/12/05 AmerGen response to RAI 2.5.1.19-1. This information is revised to include the periodic monitoring (visual inspection) of in-scope high voltage insulators above 34.5 kV. The revised text is as follows.

## License Renewal Commitment List

The item in the table below updates item 43 in the 10/12/2005 response to RAI 2.5.1.19-1. Revisions are bolded.

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
43) Periodic Monitoring of Combustion Turbine Power Plant – Electrical	<p>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 10CFR50.59 Environmental Qualification Requirements program <i>and the new Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements program</i> to manage aging effects for the electrical commodities that support FRCT operation.</p> <p>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; visual inspection of accessible phase bus and connections and phase bus insulators/supports; and <b>visual inspection of high voltage insulators above 34.5 kV for salt build-up</b>. The new program will be performed on a <b>twice per year frequency for high voltage insulator inspections</b>; 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.</p>	A.1.37	Prior to the period of extended operation	Section B.1.37

A.1.37 Periodic Monitoring of Combustion Turbine Power Plant - Electrical (Revisions are bolded.)

The new Periodic Monitoring of Combustion Turbine Power Plant - Electrical 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, **and the new Electrical Cable Connections Not Subject to 10 CFR 50.49 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; 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; and **visual inspection of high voltage insulators above 34.5 kV for salt build-up.** 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. **Electrical cable connections, metallic parts, located at the Forked River Combustion Turbine power plant will be included in the new Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements program which will test a representative sample of connections for loosening.** 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. **Visual inspections of high voltage insulators will be performed at least twice per year.** 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. **Electrical cable connections will be tested at the frequency specified in the new Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements program.**

**B.1.37 Periodic Monitoring of Combustion Turbine Power Plant – Electrical (Revisions are bolded. Revisions from this supplement are bolded and marked with a revision bar in the right hand margin.)**

**Program Description**

The new AmerGen Periodic Monitoring of Combustion Turbine Power Plant – Electrical Program, the existing Structures Monitoring Program, the new Inaccessible Medium Voltage Cables Not Subject to 10CFR50.49 Environmental Qualification Requirements program **and the new Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements program** will be used to manage aging effects for the electrical commodities that support FRCT operation.

This AmerGen program will include elements of GALL programs XI.E1 for accessible electrical cables and connections; XI.E3 for manholes, pits and cable trenches; XI.E4 for phase bus and connections and phase bus insulators; **and visual inspections of in-scope high voltage insulators above 34.5 kV.**

This AmerGen program will inspect accessible electrical cables and connections, prior to the period of extended operation, with an inspection frequency of at least once every 10 years.

This AmerGen program will inspect manholes, pits and cable trenches, containing inaccessible medium voltage cables, located on the FRCT site, for inaccessible medium voltage cables, for water collection so that draining or other corrective actions can be taken. Inspections for water collection will be performed at least once every 2 years and the frequency of inspection will be adjusted based on the results obtained. The first inspections will be completed prior to the period of extended operation.

This AmerGen program will inspect accessible phase bus and connections and phase bus insulators, prior to the period of extended operation, with an inspection frequency of at least once every 5 years.

**This AmerGen program will also inspect in-scope high voltage Insulators above 34.5 kV for salt build-up, with an inspection frequency of twice per year. The first inspections will be completed prior to the period of extended operation.**

Inspection of phase bus enclosures will be performed under the existing Structures Monitoring Program, B.1.31. The first inspection will be performed prior to the period of extended operations, with an inspection frequency of at least 4 years.

The following represents AMP B.1.36 scope for the 13.8 kV cables that distribute the output of the FRCT to both the Oyster Creek SBO transformer and the 230 kV switchyard. Inaccessible medium voltage cable 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, B.1.36. The first tests and inspections will be performed prior to the period of extended operations. **Cable tests will be performed with an initial cable test frequency of 6**

**years; subsequent test frequency will be determined by test results with a maximum period between tests of 10 years. Manhole, pit and trench inspection frequency will be at least once every 2 years.**

**Testing of a representative sample of electrical cable connections, metallic parts, will be performed by the new Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements program, B.1.40. The first tests will be performed prior to the period of extended operation, with an inspection frequency of 10 years.**

These aging management activities ensure the continued availability of the FRCTs as the alternate AC source in the event of a SBO at OCGS.

**Aging Management Program Elements (Other than headings, bolded text indicates changes)**

**(1) Scope of Activity:** The scope of this aging management program (AMP) includes electrical commodities that are subject to aging management. The electrical commodities necessary for the FRCTs to provide alternate AC power to OCGS during a SBO and subject to aging management are:

- Insulated Cables and Connections (XI.E1)
- Inaccessible Medium Voltage Cables (XI.E3)
- Phase Bus and Connections (XI.E4)
- **In-scope High Voltage Insulators above 34.5 kV**
- Phase Bus Enclosure Assemblies (Structures Monitoring, XI.S6)
- Phase Bus Insulators (XI.E4)
- **Electrical Cable Connections (Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements, XI.E6)**

This AMP provides reasonable assurance that aging effects for these commodities will be adequately managed, such that the FRCTs are available to perform their intended function for the extended period of Oyster Creek operation.

**(2) Preventive Actions:**

- There are no preventative actions associated with accessible electrical cables and connections.
- Inspection and drainage of manholes, pits and cable trenches under this AMP assist in preventing the premature aging of electrical cables.
- There are no preventative actions associated with phase bus and connections and phase bus insulators.
- **The Inspection and washing of In-scope high voltage Insulators above 34.5 kV under this AMP assist in preventing faults on high voltage circuits.**

**(3) Parameters Monitored/Inspected:** This AMP includes the following activities:

- **Accessible Electrical Cables and Connections:**  
Visual inspection of accessible electrical cables and connections exposed in enclosures, pits, manholes, and pipe trench will be performed by AmerGen. These inspections will be performed for signs of accelerated age-related degradation such as embrittlement, discoloration, cracking or surface contamination. The scope of this inspection includes accessible power, control and instrumentation cables. The first inspection will be performed prior to the period of extended operation, with an inspection frequency of at least 10 years.
- **Inaccessible Medium Voltage Cables**  
Visual inspections of manholes, pits and pipe trench, located on the FRCT site, for inaccessible medium voltage cables, will be performed by AmerGen. These inspections will be performed for evidence of excessive water collection. Inspections for water collection will be performed at least once every 2 years and the frequency of testing will be adjusted based on the results obtained. The first inspections will be completed prior to the period of extended operation.
- **Phase Bus and Connections and Phase Bus Insulators/Supports**  
Visual inspections of accessible phase bus and connections and phase bus insulators/supports will be performed by AmerGen. These inspections will be performed for signs of melting or other heat effects on the tape covering bus connections, cracking of thermoplastic or degradation of insulators/supports. The first inspection will be performed prior to the period of extended operations, with an inspection frequency of at least 5 years.
- **High Voltage Insulators**  
Visual inspection of the in-scope high voltage insulators above 34.5 kV will be performed by AmerGen. These inspections will be performed for signs of salt build-up. The first inspection will be performed prior to the period of extended operations, with an inspection frequency of at least twice per year.
- **Phase Bus Enclosure Assemblies**  
Visual inspection of the phase bus enclosure assemblies will be performed by AmerGen, under the Structures Monitoring Program, B.1.31. These inspections will be performed for signs of general corrosion or loss of weather tightness. The first inspection will be performed prior to the period of extended operations, with an inspection frequency of at least 4 years.
- **Inaccessible Medium Voltage Cable Circuits**  
Testing of inaccessible medium voltage cable circuits supporting the FRCT and inspection of the associated manholes located on the Oyster Creek site will be performed by AmerGen, under the Inaccessible Medium Voltage Cables Not Subject to 10CFR50.49 Environmental Qualification Requirements program, B.1.36. These inspections will be performed for signs of cable insulation degradation and prevention of



wetted environments. The first cable tests will be performed prior to the period of extended operations. ***Cable tests will be performed with an initial cable test frequency of 6 years; subsequent test frequency will be determined by test results with a maximum period between tests of 10 years. Manhole, pit and trench inspection frequency will be at least once every 2 years.***

- ***Electrical Cable Connections, Metallic Parts***

***A representative sample of non-EQ electrical cable connections within the scope of license renewal 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.***

**(4) Detection of Aging Effects:** The AmerGen inspection of electrical commodities described above will ensure that aging effects on cables and phase bus are detected prior to loss of intended function.

- **Accessible Electrical Cables and Connections:**

Conductor insulation aging degradation from heat or moisture in the presence of oxygen causes cable and connection jacket surface anomalies. Accessible electrical cables and connections in at the FRCT are visually inspected for cable and connection jacket anomalies, such as embrittlement, discoloration, cracking or surface contamination. Accessible electrical cables and connections will be performed prior to the period of extended operation and inspected at least once every 10 years.

- **Inaccessible Medium Voltage Cables**

The actions under this program addressing inaccessible medium voltage cables are preventative only.

- **Accessible Phase Bus and Connections and Phase Bus Insulators/Supports**

Bolted connections will be checked for loose connection by performing visual inspections for aging degradation of insulating materials and for foreign debris and excessive dust build-up, and evidence of moisture intrusion. Bus insulations will be visually inspected for signs of embrittlement, cracking, melting, swelling, or discoloration, which may indicate overheating or aging degradation. Bus supports will be inspected for structural integrity and signs of cracks. The program will be completed prior to the period of extended operation and every 5 years thereafter.

- **High Voltage Insulators**

In-scope high voltage insulators above 34.5 kV will be checked for salt build-up by performing visual inspections. If contamination is identified, the inspections will distinguish between slight, medium and heavy levels of contamination based on the lack of a shiny surface appearance (slight); build-up of contamination at the

**base of the insulators or indication of dripping (medium); or audible noise or visible corona (heavy). Inspections will begin prior to the period of extended operation and occur twice a year thereafter.**

**(5) Monitoring and Trending:**

- Monitoring of electrical commodities involves visual inspection activities by qualified individuals, at specified intervals, to determine the condition of the cables and connections.
- Monitoring of electrical commodities involves visual inspection activities by qualified individuals, at specified intervals, to determine if there is standing water in manholes, pits and trenches.
- Monitoring of electrical commodities involves visual inspection activities by qualified individuals at specified intervals to determine the condition of phase bus.
- **Monitoring of electrical commodities involves visual inspection activities by qualified individuals at specified intervals to determine if there is salt build-up on the insulators.**

Results of inspections performed by both FirstEnergy, under their routine activities, and AmerGen, under this new program are reviewed by OCGS engineering as part of confirmation and monitoring the reliability of the FRCTs.

**(6) Acceptance Criteria:** Acceptance criteria for the electrical commodity inspections are as follows:

- **Accessible Electrical Cables and Connections:**  
The accessible cables and connections are to be free from unacceptable, visual indications of surface anomalies, which suggest that conductor insulation or connection degradation exists.
- **Inaccessible Medium Voltage Cables**  
Manholes, pits, and cable trenches are to be free from standing water.
- **Accessible Phase Bus and Connections and Phase Bus Insulators/Supports**  
Phase bus is to be free from unacceptable visual indications of surface anomalies, suggesting conductor insulation degradation exists.
- **High Voltage Insulators**  
**High voltage insulators are to be free from salt build-up. If contamination is identified, the inspections will distinguish between slight, medium and heavy levels of contamination based on the lack of a shiny surface appearance (slight); build-up of contamination at the base of the insulators or indication of dripping**

**(medium); or audible noise or visible corona (heavy). Subsequent corrective actions will be aligned with the level of contamination.**

- (7) Corrective Action:** If an inspection identifies a degraded condition, a Corrective Action Program Issue Report will be initiated in accordance with 10 CFR Part 50, Appendix B plant administrative procedures. The degraded condition will be evaluated and corrective actions are taken as necessary. The 10 CFR Part 50 Appendix B corrective action program ensures that conditions adverse to quality are properly corrected. If the deficiency is found to be significantly adverse to quality, the cause of the condition is determined and an action plan is developed to preclude recurrence.
- (8) Confirmation Process:** Site quality assurance procedures, review and approval processes and administrative controls are implemented in accordance with the requirements of 10 CFR Part 50, Appendix B.
- (9) Administrative Controls:** See Item 8 above.
- (10) Operating Experience:** While this is a new program, FRCT has not experienced a cable or bus related failure during its period of operation.

The 2004 inspection involved major rework and repair of the exhaust plenum after and forward walls, including complete rebuild and re-wiring of the load compartment and junction boxes, and extensive alignment activities. These major efforts ensured that the FRCT cables and connections were in optimal condition when returned to service. Lessons learned from routine inspections are incorporated into future outage scope.

On September 18, 2003, arcing was observed on 230kV insulators in the Oyster Creek Switchyard. This event was entered and evaluated in the Oyster Creek corrective action process (CAP No. O2003-1925). The arcing was not severe enough to cause ground faults. No protective relaying was actuated. There was no associated loss of offsite power to Oyster Creek. The observations made in the switchyard are consistent with salt spray on the insulators. This occurrence was the result of unusual weather conditions experienced during the passing of hurricane Isabel. The high winds and waves resulted in wind blown salty spray being deposited on the insulators. The electrical conductivity of the salty moisture on the insulators caused the observed flashing. Oyster Creek has not experienced any arcing leading to loss of offsite power events attributable to salt contamination.

**Enhancements:**

None.

**Conclusion:**

The Periodic Monitoring of Combustion Turbine Power Plant – Electrical Program will effectively manage the aging of insulated cables and connections; inaccessible medium voltage cables;

and phase bus and connections and phase bus insulators; **high voltage insulators**; phase bus enclosures; **and electrical cable connections** such that there is reasonable assurance that the intended functions of the FRCTs will be maintained consistent with the current licensing basis during the period of extended operation.

**LRA Text Changes and AmerGen October 12, 2005 Response to RAI 2.5.1.19-1 Text Changes Associated With RAI 3.6.2.3.3**

Note: Changes to previously submitted information and new information are designated by text bolding. Existing LRA text is identified by italics.

The second to last paragraph in the "Electrical Systems and Components" section of LRA Section 2.1.6.1, Identification of Structures and Components Subject to AMR, requires revision. This paragraph currently identifies that electrical components that are part of a larger active component are screened out. This paragraph should be revised to read:

*The electrical components that require an aging management review are the separate electrical components that are not a part of a larger active component. For example, the wiring and terminal blocks located internal to a breaker cubicle were considered to be parts of the breaker. Accordingly, the breaker is screened, but not the individual internal parts. The only exception to this screening criteria is the consideration of electrical cable connections, metallic parts, for inclusion in the population of connections to be sampled and subsequently tested per the GALL aging management program XI.E6 (corresponding to Oyster Creek aging management program B.1.40).*

In section 3.6.2.1.7 of the Oyster Creek LRA sentences following two subheadings require revision. The sentence addressing "Aging Effects Requiring Management" is replaced as follows:

**The following aging effects associated with the *electrical cable connections* require aging management:**

- **Loosening of bolted connections due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, and oxidation.**

The first sentence of the section addressing "Aging Management Programs" should read:

**The following aging management program manages the aging effects for electrical cable connections – metallic parts:**

- **Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements.**

Section 3.6.2.3.3 shall have all text deleted and shall be retitled: **"Not Used"**. Further Evaluation of this electrical commodity is not required per NUREG-1801, Table VI Electrical Components, item number VI.A-1 (LP-12).

***In section 3.6.2.1.9 provided in Appendix C from the AmerGen October 12, 2005 response to RAI 2.5.1.19-1, the following should be added to the bullet list of "Aging Effects Requiring Management."***

- ***Loosening of bolted connections due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion and oxidation***

***LRA Table 3.6.1, Summary of Aging Management Programs, line item 3.6.1-13 requires revision. LRA Table 3.6.2.1.1, Electrical Commodity Groups, Summary of Aging Management Evaluation, information for the component type of cable connections (metallic parts) requires revision. A complete printout of these tables is provided at the end of this appendix incorporating revisions for changes for high voltage insulators and electrical cable connections – metallic parts.***

***The AmerGen October 12, 2005 Response to RAI 2.5.1.19-1 Table 3.6.1A, Summary of Aging Management Evaluations for the Station Blackout System – Electrical, line item 3.6.1-13 requires revision. The AmerGen October 12, 2005 Response to RAI 2.5.1.19-1 Table 3.6.2.1.2A, Station Blackout System – Electrical Commodities Summary of Aging Management Evaluation Information for the component type of electrical cable connections – metallic parts - requires revision. A complete printout of these tables is provided at the end of this appendix incorporating revisions for changes for high voltage insulators and electrical cable connections – metallic parts.***

Updates showing the impacts of this change on LRA Appendix A (Table A.5 and new section A.1.40) and LRA Appendix B (new section B.1.40) are provided below. No bolding of text details (***other than changes from this supplement***) is used since the entries are new in their entirety.

#### A.5 License Renewal Commitment List

The item in the table below is a new commitment submitted as part of the response to RAI 3.6.2.3.3  
All column entries associated with this new commitment are new additions.

ITEM NUMBER	COMMITMENT	UFSAR SUPPLEMENT LOCATION (LRA APP. A)	ENHANCEMENT OR IMPLEMENTATION SCHEDULE	SOURCE
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 <i>within the scope of license renewal</i> 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

#### 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.



#### **B.1.40 Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements**

##### **Program Description**

This new aging management program will be used to manage the aging effects of metallic parts of non-EQ electrical cable connections within the scope of license renewal. It will address cable connections that are used to connect cable conductors to other cables or electrical devices. The most common types of connections used in nuclear power plants are splices (butt or bolted), crimp-type ring lugs, connectors, and terminal blocks. Most connections involve insulating material and metallic parts. This aging management program will account for the aging stressors of thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, and oxidation of the metallic parts.

Electrical cable connections, metallic parts, not subject to 10 CFR 50.49 environmental qualification requirements, *within the scope of license renewal (including those located at Oyster Creek, the Forked River Combustion Turbine power plant and the Meteorological Tower)* that are subject to aging stressors will be managed by testing to provide an indication of the integrity of the cable connections. The type of test to be performed, i.e., thermography, is a proven test for detecting loose connections. A representative sample of electrical cable connections will be tested.

This program, as described, can be thought of as a sampling program. The following factors are considered for sampling: application (high, medium and low voltage), circuit loading, and location (high temperature, high humidity, vibration, etc.) with respect to connection stressors. If an unacceptable condition or situation is identified in the selected sample, a determination is made as to whether the same condition or situation is applicable to other connections not tested.

A sample of non-EQ electrical cable connections metallic parts will be tested prior to the period of extended operation, with an inspection frequency of at least once every 10 years.

##### **Aging Management Program Elements**

###### **(1) Scope of Program:**

The metallic parts of electrical cable connections, not subject to 10 CFR 50.49, associated with cables *within* scope of license renewal are part of this program, regardless of their association with active or passive components

###### **(2) Preventative Actions**

No actions are taken as part of this program to prevent or mitigate aging degradation.

###### **(3) Parameters Monitored/Inspected**

This program will focus on the metallic parts of electrical cable connections. The monitoring includes loosening of bolted connections due to thermal cycling, ohmic heating, electrical

transients, vibration, chemical contamination, corrosion, and oxidation. A representative sample of electrical cable connections is tested. The following factors are to be considered for sampling: application (high, medium and low voltage), circuit loading, and location (high temperature, high humidity, vibration, etc.) with respect to connection stressor. The technical basis for the sample selected is to be documented.

#### **(4) Detection of Aging Effects**

Electrical cable connections – metallic parts - not subject to 10 CFR 50.49 environmental qualification requirements within the scope of license renewal will be tested at least once every 10 years. Testing will utilize thermography. This is an adequate period to preclude failures of the electrical connections since experience has shown that aging degradation is a slow process. A 10-year testing interval will provide two data points during a 20-year period, which can be used to characterize the degradation rate. The first tests for license renewal are to be completed before the period of extended operation.

#### **(5) Monitoring and Trending**

Trending actions are not included as part of this program.

#### **(6) Acceptance Criteria**

***Measured temperature by thermography should be evaluated against baseline(s), if available, or similarly configured component(s). Consideration should be given to ambient temperature, electrical load, system operating parameters and visual indications when determining if measured temperature is acceptable or requires further evaluation.***

#### **(7) Corrective Actions**

Unacceptable test results for electrical cable connections will be subject to an engineering evaluation under the corrective action process. Such an evaluation will consider the age and operating condition and environment of the connection. When an unacceptable condition or situation is identified, a determination will be made as to whether the same condition or situation is applicable to the other connections.

Oyster Creek's corrective action process is governed by 10 CFR 50, Appendix B and is implemented by corporate administrative procedures. The corrective action process generically applies to Oyster Creek activities, even when not specifically invoked by a procedure line item.

#### **(8) Confirmation Process**

Site quality assurance (QA) procedures, review and approval processes, and administrative controls are implemented in accordance with the requirements of 10 CFR Part 50, Appendix B.

**(9) Administrative Controls**

Site quality assurance (QA) procedures, review and approval processes, and administrative controls are implemented in accordance with the requirements of 10 CFR Part 50, Appendix B.

**(10) Operating Experience**

This is a new aging management program. Review of existing Oyster Creek operating experience did not identify significant occurrences of failures associated with this aging management program. Since there is no adverse Oyster Creek operating experience information, this new aging management program will be implemented in alignment with GALL XI.E6 recommendations, including assessment of stressors, implementation of a sampling approach and a frequency of every 10-years, with the first inspection prior to the period of extended operation. ***Going forward, operating experience, both internal and external, will be used at Oyster Creek to enhance this program, prevent repeat events, and prevent events that have occurred at other plants from occurring at Oyster Creek. This will be implemented through the Oyster Creek Operating Experience process. The Operating Experience process screens, evaluates, and acts on operating experience documents and information to prevent or mitigate the consequences of similar events. Additionally, the process for managing programs requires the review of program related operating experience by the program owner.***

**NUREG-1801 Consistency**

The aging management program for Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements is a new program. The program will be implemented prior to the period of extended operation. Program activities are consistent with the ten elements of aging program XI.E6, Electrical Cable Connections – Metallic Parts - Not Subject to 10 CFR 50.49 Environmental Qualification Requirements, specified in NUREG-1801.

**Exceptions to NUREG-1801**

None.

**Enhancements**

None.

**Conclusion**

The aging management program for Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements provides reasonable assurance that aging effects will be adequately managed so that the intended functions of electrical

**cable connections are maintained consistent with the current licensing basis during the period of extended operation.**

**Table 3.6.1**

**Summary of Aging Management Programs for the Electrical Components Evaluated in Chapter VI of NUREG-1801**

<b>Item Number</b>	<b>Component</b>	<b>Aging Effect/ Mechanism</b>	<b>Aging Management Programs</b>	<b>Further Evaluation Recommended</b>	<b>Discussion</b>
3.6.1-1	Electrical equipment subject to 10 CFR 50.49 environmental qualification (EQ) requirements	Degradation due to various aging mechanisms	Environmental qualification of electric components	Yes, TLAA	This TLAA is further evaluated in Section 4.4 and Subsection 3.6.2.2.1.
3.6.1-2	Electrical cables, connections and fuse holders (insulation) not subject to 10 CFR 50.49 EQ requirements	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure due to thermal/thermooxidative degradation of organics; radiolysis and photolysis (ultraviolet [UV] sensitive materials only) of organics; radiation-induced oxidation; and moisture intrusion	Aging management program for electrical cables and connections not subject to 10 CFR 50.49 EQ requirements	No	Consistent with NUREG-1801. The Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements program, B.1.34, will be used to inspect cable and connection insulation to identify and assess aging effects that may be occurring due to the existence of adverse localized environments

**Table 3.6.1**

**Summary of Aging Management Programs for the Electrical Components Evaluated in Chapter VI of NUREG-1801**

<b>Item Number</b>	<b>Component</b>	<b>Aging Effect/ Mechanism</b>	<b>Aging Management Programs</b>	<b>Further Evaluation Recommended</b>	<b>Discussion</b>
3.6.1-3	Electrical cables and connections used in instrumentation circuits not subject to 10 CFR 50.49 EQ requirements that are sensitive to reduction in conductor insulation resistance (IR)	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced IR; electrical failure due to thermal/thermooxidative degradation of organics; radiation-induced oxidation; and moisture intrusion	Aging management program for electrical cables and connections used in instrumentation circuits not subject to 10 CFR 50.49 EQ requirements	No	Consistent with NUREG-1801. The Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used In Instrumentation Circuits program, B.1.35, will be used to inspect cable and connection insulation in instrumentation circuits to identify and assess aging effects that may be occurring due to the existence of adverse localized environments
3.6.1-4	Inaccessible medium-voltage (2 kV to 15 kV) cables (e.g., installed in conduit or direct buried) not subject to 10 CFR 50.49 EQ requirements	Formation of water trees, localized damage leading to electrical failure (breakdown of insulation); water trees due to moisture intrusion	Aging management program for inaccessible medium-voltage cables not subject to 10 CFR 50.49 EQ requirements	No	Consistent with NUREG-1801. The Inaccessible Medium Voltage Cables Not Subject To 10 CFR 50.49 Environmental Qualification Requirements program, B.1.36, will be used to inspect inaccessible medium voltage cable and connection insulation to identify and assess aging effects that may be occurring due to the existence of adverse localized environments
3.6.1-5	<b>PWR Only</b>				
3.6.1-6	Fuse holders (metallic clamp)	Fatigue due to ohmic heating, thermal cycling, electrical transients, frequent manipulation, vibration, chemical contamination, corrosion, and oxidation	Aging management program for fuse holders	No	NUREG-1801 aging effect is not applicable to Oyster Creek. See Subsection 3.6.2.3.1 for further evaluation

**Table 3.6.1**

**Summary of Aging Management Programs for the Electrical Components Evaluated in Chapter VI of NUREG-1801**

<b>Item Number</b>	<b>Component</b>	<b>Aging Effect/ Mechanism</b>	<b>Aging Management Programs</b>	<b>Further Evaluation Recommended</b>	<b>Discussion</b>
3.6.1-7	Phase bus - Bus/connections	Loosening of bolted connections due to thermal cycling and ohmic heating	Aging management program for bus duct	No	Not Applicable. Oyster Creek has no phase bus in the scope of license renewal
3.6.1-8	Phase bus – Insulation/insulators	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure due to thermal/thermooxidative degradation of organics/thermoplastics, radiation-induced oxidation; moisture/debris intrusion, and ohmic heating	Aging management program for bus duct	No	Not Applicable. Oyster Creek has no phase bus in the scope of license renewal
3.6.1-9	Phase bus – Enclosure assemblies	Loss of material due to general corrosion	Structures Monitoring Program	No	Not Applicable. Oyster Creek has no phase bus in the scope of license renewal
3.6.1-10	Phase bus – Enclosure assemblies	Hardening and loss of strength/ elastomers degradation	Structures Monitoring Program	No	Not Applicable. Oyster Creek has no phase bus in the scope of license renewal

**Table 3.6.1**

**Summary of Aging Management Programs for the Electrical Components Evaluated in Chapter VI of NUREG-1801**

<b>Item Number</b>	<b>Component</b>	<b>Aging Effect/ Mechanism</b>	<b>Aging Management Programs</b>	<b>Further Evaluation Recommended</b>	<b>Discussion</b>
3.6.1-11	High voltage insulators	Degradation of insulation quality due to presence of any salt deposits and surface contamination; Loss of material caused by mechanical wear due to wind blowing on transmission conductors	Plant specific	Yes, plant specific	<b>Consistent with NUREG-1801</b>
3.6.1-12	Transmission conductors and connections, Switchyard bus and connections	Loss of material due to wind induced abrasion and fatigue; Loss of conductor strength due to corrosion; Increased resistance of connection due to oxidation or loss of pre-load	Plant specific	Yes, plant specific	NUREG-1801 aging effect is not applicable to Oyster Creek transmission conductors and connections. See subsection 3.6.2.2.6 for further evaluation.  Oyster Creek has no switchyard bus and connections in the scope of license renewal.
3.6.1-13	Cable Connections (Metallic parts)	Loosening of bolted connections due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, and oxidation	Aging management program for electrical cable connections not subject to 10 CFR 50.49 environmental qualification requirements	No	<b>Consistent with NUREG-1801</b>
3.6.1-14	Fuse Holders (Not Part of a Larger Assembly) Insulation material	None	None	N/A	Consistent with NUREG-1801



**Table 3.6.2.1.1 Electrical Commodity Groups Summary of Aging Management Evaluation**

**Table 3.6.2.1.1 Electrical Commodity Groups**

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Programs</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Cable Connections (Metallic Parts)	Electrical Continuity	Various metals used for electrical connections	Containment Atmosphere (External)	Loosening of bolted connections due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion and oxidation	Electrical Cable Connections - Metallic Parts - Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B.1.40)	VI.A-1 (LP-12)	3.6.1-13	A
			Indoor Air (External)	Loosening of bolted connections due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion and oxidation	Electrical Cable Connections - Metallic Parts - Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B.1.40)	VI.A-1 (LP-12)	3.6.1-13	A
			Outdoor Air (External)	Loosening of bolted connections due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion and oxidation	Electrical Cable Connections - Metallic Parts - Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B.1.40)	VI.A-1 (LP-12)	3.6.1-13	A
Electrical Equipment Subject To 10 CFR 50.49 EQ Requirements	Electrical continuity	Various polymeric and metallic materials	Adverse Localized Environment (Electrical Only)	Various degradation/ various mechanisms	Environmental Qualification (EQ) Program (B.3.2)	VI.B-1(L-05)	3.6.1-1	A

**Table 3.6.2.1.1 Electrical Commodity Groups (Continued)**

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Electrical penetrations	Electrical Continuity (pigtailed)	Various organic polymers (e.g., EPR, EXPE, PVC, ETFE)	Adverse Localized Environment (External)	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure/ degradation of organics (Thermal/ thermoxidative), radiolysis and photolysis (UV sensitive materials only) of organics; radiation-induced oxidation, and moisture intrusion	Electrical Cables and Connections Not Subject to 10CFR50.49 Environmental Qualification Requirements (B.1.34)			J, 1
	Pressure Boundary	Epoxy Potting	Containment Atmosphere (External)	None	None			J, 1
Fuse Holders	Electrical Continuity	Copper alloy (Metallic Clamps)	Indoor Air (External)	None	None	VI.A-8 (LP-01)	3.6.1-6	I, 2
	Insulation - Electrical	Insulation material - bakelite, phenolic melamine or ceramic, molded polycarbonate and other	Adverse Localized Environment (External)	None	None	VI.A-6 (LP-03)	3.6.1-2	I, 2
		Insulation material - bakelite, phenolic melamine or ceramic, molded polycarbonate and other	Indoor Air (External)	None	None	VI.A-7 (LP-02)	3.6.1-14	A

**Table 3.6.2.1.1 Electrical Commodity Groups (Continued)**

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
High Voltage Insulators	Insulation - Electrical	Porcelain Malleable iron, aluminum, galvanized steel, cement	Outdoor Air (External)	Degradation of Insulator Quality / Presence of any Salt Deposits	Periodic Monitoring of Combustion Turbine Power Plant - Electrical (B.1.37)	VI.A-9 (LP-07)	3.6.1-11	E, 3
				None	None	VI.A-10 (LP-11)	3.6.1-11	I, 4
Insulated cables and connections	Electrical Continuity	Various organic polymers (e.g., EPR, XLPE, PVC, ETFE)	Adverse Localized Environment (External)	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure/ degradation of organics (Thermal/ thermoxidative), radiolysis and photolysis (UV sensitive materials only) of organics; radiation-induced oxidation, and moisture intrusion	Electrical Cables and Connections Not Subject to 10CFR50.49 Environmental Qualification Requirements (B.1.34)	VI.A-2 (L-01)	3.6.1-2	A

**Table 3.6.2.1.1 Electrical Commodity Groups (Continued)**

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Insulated cables and connections in instrumentation circuits	Electrical Continuity	Various organic polymers (e.g., EPR, XLPE, PVC, ETFE)	Adverse Localized Environment (External)	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure/ degradation of organics (Thermal/ thermoxidative), radiolysis and photolysis (UV sensitive materials only) of organics; radiation-induced oxidation, and moisture intrusion	Electrical Cables and Connections Not Subject to 10CFR50.49 Environmental Qualification Requirements Used in Instrumentation Circuits (B.1.35)	VI.A-3 (L-02)	3.6.1-3	A
Insulated inaccessible medium-voltage cables	Electrical Continuity	Various organic polymers (e.g., EPR, XLPE, PVC, ETFE)	Adverse Localized Environment (External)	Localized damage and breakdown of insulation leading to electrical failure/ moisture intrusion, water trees	Inaccessible Medium Voltage Cables Not Subject to 10CFR50.49 Environmental Qualification Requirements, (B.1.36)	VI.A-4 (L-03)	3.6.1-4	A
Transmission conductors and connections	Electrical Continuity	Aluminum, steel	Outdoor Air (External)	None	None	VI.A-16 (LP-08)	3.6.1-12	I, 5
Uninsulated Ground Conductors	Electrical Continuity	Copper	Containment Atmosphere (External)	None	None			J, 7
			Indoor Air (External)	None	None			J, 7
			Outdoor Air (External)	None	None			J, 7

**Table 3.6.2.1.1 Electrical Commodity Groups (Continued)**

<b>Component Type</b>	<b>Intended Function</b>	<b>Material</b>	<b>Environment</b>	<b>Aging Effect Requiring Management</b>	<b>Aging Management Programs</b>	<b>NUREG-1801 Vol. 2 Item</b>	<b>Table 1 Item</b>	<b>Notes</b>
Wooden Utility Poles	Structural Support	Treated Wood	Outdoor Air (External)	Change in Material Properties		Wooden Utility Poles (B.2.6)		J
				Loss of Material		Wooden Utility Poles (B.2.6)		J
			Soil (External)	Change in Material Properties		Wooden Utility Poles (B.2.6)		J
				Loss of Material		Wooden Utility Poles (B.2.6)		J

**Notes    Definition of Note**

- A Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG1801 AMP.
- B Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- C Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
- D Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
- E Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
- F Material not in NUREG-1801 for this component.
- G Environment not in NUREG-1801 for this component and material.
- H Aging effect not in NUREG-1801 for this component, material and environment combination.
- I Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
- J Neither the component nor the material and environment combination is evaluated in NUREG-1801.

**Plant Specific Notes:**

1. Insulation internal to Oyster Creek electrical penetrations and epoxy potting sealing material have a service life in excess of 60 years. Pigtales are included in the scope of the Electrical Cables and Connections Not Subject to 10CFR50.49 Environmental Qualification Requirements Aging Management Program. See Subsection 3.6.2.3.2 for additional information.
2. Oyster Creek fuse holders (not part of a larger assembly) do not experience the aging effects identified in NUREG-1801 due to their location and environment. See Subsection 3.6.2.3.1 for additional information.
3. Oyster Creek high voltage Insulators In the scope of license renewal above 34.5kV will be periodically inspected under the Periodic Monitoring of Combustion Turbine Power Plant - Electrical (B.1.37) aging management program.
4. Oyster Creek high voltage insulators do not experience the mechanical wear identified in NUREG-1801. See subsection 3.6.2.2.5 for additional information.
5. Oyster Creek transmission conductors and connections do not experience the aging effects identified in NUREG-1801. See subsection 3.6.2.2.6 for additional information.
6. Not used.
7. Oyster Creek uninsulated ground conductors do not experience aging effects requiring management. See subsection 3.6.2.3.4 for additional information.

**Table 3.6.1A Summary of Aging Management Evaluations for the Station Blackout System – Electrical**

<b>Item Number</b>	<b>Component</b>	<b>Aging Effect/ Mechanism</b>	<b>Aging Management Programs</b>	<b>Further Evaluation Recommended</b>	<b>Discussion / Further Evaluation</b>
3.6.1-1	Electrical equipment subject to 10 CFR 50.49 environmental qualification (EQ) requirements	Degradation due to various aging mechanisms	Environmental qualification of electric components	Yes, TLAA	Not applicable. FRCT contains no components subject to 10 CFR 50.49 EQ requirements
3.6.1-2	Electrical cables, connections and fuse holders (insulation) not subject to 10 CFR 50.49 EQ requirements	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure due to thermal/thermooxidative degradation of organics; radiolysis and photolysis (ultraviolet [UV] sensitive materials only) of organics; radiation-induced oxidation; and moisture intrusion	Aging management program for electrical cables and connections not subject to 10 CFR 50.49 EQ requirements	No	The Periodic Monitoring of Combustion Turbine Power Plant – Electrical Program, B.1.37, will be used to inspect cable and connection insulation to identify and assess aging effects that may be occurring due to the existence of adverse localized environments. FRCT has no fuse holders or terminal blocks outside larger, active components such as control panels or motor control centers.

**Table 3.6.1A Summary of Aging Management Evaluations for the Station Blackout System – Electrical**

<b>Item Number</b>	<b>Component</b>	<b>Aging Effect/ Mechanism</b>	<b>Aging Management Programs</b>	<b>Further Evaluation Recommended</b>	<b>Discussion / Further Evaluation</b>
3.6.1-3	Electrical cables and connections used in instrumentation circuits not subject to 10 CFR 50.49 EQ requirements that are sensitive to reduction in conductor insulation resistance (IR)	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced IR; electrical failure due to thermal/thermooxidative degradation of organics; radiation-induced oxidation; and moisture intrusion	Aging management program for electrical cables and connections used in instrumentation circuits not subject to 10 CFR 50.49 EQ requirements	No	Not applicable. FRCT has no instrumentation circuits as defined in NUREG-1801 Section XI.E2.
3.6.1-4	Inaccessible medium-voltage (2 kV to 15 kV) cables (e.g., installed in conduit or direct buried) not subject to 10 CFR 50.49 EQ requirements	Formation of water trees, localized damage leading to electrical failure (breakdown of insulation); water trees due to moisture intrusion	Aging management program for inaccessible medium-voltage cables not subject to 10 CFR 50.49 EQ requirements	No	Consistent with NUREG-1801. The Inaccessible Medium Voltage Cables Not Subject To 10 CFR 50.49 Environmental Qualification Requirements program, B.1.36, will be used to inspect inaccessible medium voltage cable and connection insulation to identify and assess aging effects that may be occurring due to the existence of adverse localized environments.
3.6.1-5	PWR Only				
3.6.1-6	Fuse holders (metallic clamp)	Fatigue due to ohmic heating, thermal cycling, electrical transients, frequent manipulation, vibration, chemical contamination, corrosion, and oxidation	Aging management program for fuse holders	No	Not applicable. FRCT has no fuse holders other than those located within a larger active component such as a control panel.



**Table 3.6.1A Summary of Aging Management Evaluations for the Station Blackout System – Electrical**

<b>Item Number</b>	<b>Component</b>	<b>Aging Effect/ Mechanism</b>	<b>Aging Management Programs</b>	<b>Further Evaluation Recommended</b>	<b>Discussion / Further Evaluation</b>
3.6.1-7	Phase bus - Bus/connections	Loosening of bolted connections due to thermal cycling and ohmic heating	Aging management program for bus duct	No	The Periodic Monitoring of Combustion Turbine Power Plant – Electrical Program, B.1.37, will be used to inspect phase bus associated connections and insulators to identify and assess aging effects.
3.6.1-8	Phase bus – Insulation/insulators	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure due to thermal/thermooxidative degradation of organics/thermoplastics, radiation-induced oxidation; moisture/debris intrusion, and ohmic heating	Aging management program for bus duct	No	The Periodic Monitoring of Combustion Turbine Power Plant – Electrical Program, B.1.37, will be used to inspect phase bus and associated connections and insulators to identify and assess aging effects.
3.6.1-9	Phase bus – Enclosure assemblies	Loss of material due to general corrosion	Structures Monitoring Program	No	Consistent with NUREG-1801. The Structures Monitoring Program will be used to monitor Phase Bus Enclosures and associated seals & gaskets.
3.6.1-10	Phase bus – Enclosure assemblies	Hardening and loss of strength/ elastomers degradation	Structures Monitoring Program	No	Consistent with NUREG-1801. The Structures Monitoring Program will be used to monitor Phase Bus Enclosures and associated seals & gaskets.

**Table 3.6.1A Summary of Aging Management Evaluations for the Station Blackout System – Electrical**

<b>Item Number</b>	<b>Component</b>	<b>Aging Effect/ Mechanism</b>	<b>Aging Management Programs</b>	<b>Further Evaluation Recommended</b>	<b>Discussion / Further Evaluation</b>
3.6.1-11	High voltage insulators	Degradation of insulation quality due to presence of any salt deposits and surface contamination; Loss of material caused by mechanical wear due to wind blowing on transmission conductors	Plant specific	Yes, plant specific	<b><i>Consistent with NUREG-1801</i></b>
3.6.1-12	Transmission conductors and connections, Switchyard bus and connections	Loss of material due to wind induced abrasion and fatigue; Loss of conductor strength due to corrosion; Increased resistance of connection due to oxidation or loss of pre-load	Plant specific	Yes, plant specific	NUREG-1801 aging effect is not applicable to FRCT. The evaluation in Oyster Creek LRA Subsection 3.6.2.2.6 is applicable to FRCT transmission conductors and connections. FRCT has no switchyard bus and connections in scope of license renewal.
3.6.1-13	Cable Connections (Metallic parts)	Loosening of bolted connections due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion, and oxidation	Aging management program for electrical cable connections not subject to 10 CFR 50.49 environmental qualification requirements	No	<b><i>Consistent with NUREG-1801</i></b>
3.6.1-14	Fuse Holders (Not Part of a Larger Assembly) Insulation material	None	None	N/A	Not applicable. FRCT has no fuse holders other than those located within a larger active component such as a control panel.

**Table 3.6.2.1.2A**  
**Station Blackout System - Electrical Commodities**  
**Summary of Aging Management Evaluation**

**Table 3.6.2.1.2A Station Blackout System - Electrical Commodities**

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Cable Connections (Metallic Parts)	Electrical Continuity	Various metals used for electrical connections	Indoor Air (External)	<i>Loosening of bolted connections due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion and oxidation</i>	<i>Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B.1.40)</i>	VI.A-1 (LP-12)	3.6.1-13	A
			Outdoor Air (External)	<i>Loosening of bolted connections due to thermal cycling, ohmic heating, electrical transients, vibration, chemical contamination, corrosion and oxidation</i>	<i>Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (B.1.40)</i>	VI.A-1 (LP-12)	3.6.1-13	A
High Voltage Insulators	Insulation - Electrical	Porcelain, malleable iron, aluminum, galvanized steel, cement	Outdoor Air (External)	<i>Degradation of Insulator Quality/Presence of any Salt Deposits</i>	<i>Periodic Monitoring of Combustion Turbine Power Plant (B.1.37) - Electrical</i>	VI.A-9 (LP-07)	3.6.1-11	E, 7
				None	None	VI.A-10 (LP-11)	3.6.1-11	I, 8

**Table 3.6.2.1.2A Station Blackout System - Electrical Commodities (Continued)**

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Insulated Cables and Connections	Electrical Continuity	Various organic polymers (e.g., EPR)	Adverse Localized Environment (Electrical Only) (External)	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure/degradation of organics (Thermal/thermooxidative), radiolysis and photolysis (UV sensitive materials only) of organics; radiation-induced oxidation, and moisture intrusion	Periodic Monitoring of Combustion Turbine Power Plant (B.1.37) - Electrical	VI.A-2 (L-01)	3.6.1-2	E, 2
Insulated Inaccessible Medium-Voltage Cables	Electrical Continuity	Various organic polymers (e.g., EPR)	Adverse Localized Environment (Electrical Only) (External)	Localized damage and breakdown of insulation leading to electrical failure / moisture infusion, water trees	Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements.(B.1.36)	VI.A-4 (L-03)	3.6.1-4	A, 3
Phase Bus and Connections	Electrical Continuity	Copper	Indoor Air (External)	Corrosion, loosening of bolted connections due to thermal cycling and ohmic heating	Periodic Monitoring of Combustion Turbine Power Plant (B.1.37) - Electrical	VI.A-11 (LP-04)	3.6.1-7	E, 5
Phase Bus Enclosure Assemblies	Enclosure Protection	Carbon and low alloy steel	Indoor Air (Internal)	Loss of Material	Structures Monitoring Program (B.1.31)	VI.A-13 (LP-06)	3.6.1-9	A, 6
			Outdoor Air (External)	Loss of Material	Structures Monitoring Program (B.1.31)	VI.A-13 (LP-06)	3.6.1-9	A, 6
		Elastomer	Indoor Air (Internal)	Change in Material Properties	Structures Monitoring Program (B.1.31)	VI.A-12 (LP-10)	3.6.1-10	A

**Table 3.6.2.1.2A Station Blackout System - Electrical Commodities (Continued)**

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Phase Bus Enclosure Assemblies	Enclosure Protection	Elastomer	Outdoor Air (External)	Change in Material Properties	Structures Monitoring Program (B.1.31)	VI.A-12 (LP-10)	3.6.1-10	A
	Insulation - Electrical	Porcelain, Various Metals, Thermo-plastic organic polymers	Indoor Air (External)	Embrittlement, cracking, melting, discoloration, swelling, or loss of dielectric strength leading to reduced insulation resistance (IR); electrical failure/thermal/thermo-oxidative degradation of organics/thermoplastics, radiation-induced oxidation; moisture/debris intrusion, and ohmic heating	Periodic Monitoring of Combustion Turbine Power Plant (B.1.37) - Electrical	VI.A-14 (LP-05)	3.6.1-8	E
Transmission Conductors and Connections	Electrical Continuity	Aluminum, Steel	Outdoor Air (External)	None	None	VI.A-16 (LP-08)	3.6.1-12	I, 9
Uninsulated Ground Conductors	Electrical Continuity	Copper	Indoor Air (External)	None	None			J, 4
			Outdoor Air (External)	None	None			J, 4

Notes	Definition of Note
A	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

#### Plant Specific Notes:

1. **Not used.**
2. FRCT insulated cables and connections inside enclosures are run in hard or flexible conduit directly to the load device and are not accessible for visual inspection. The only high temperature adverse localized environment identified is the turbine compartment in which no cables are located. The starting diesel operates for a short period during plant startup, therefore the starting diesel compartment is not considered an adverse environment. There are no radiation sources at the FRCT site.
3. FRCT includes a pair of 13.8kV underground circuits to the Oyster Creek site and a pair of 13.8 kV circuits to Transformer Banks 9 & 10 feeding the 230 kV substation. These circuits are continually energized to ensure the reliability of the AAC source.
4. FRCT uninsulated ground conductors do not experience aging effects requiring management. The evaluation presented in Oyster Creek LRA Subsection 3.6.2.3.4 is applicable to FRCT.
5. FRCT phase busses are coated to prevent oxidation, and connections are taped. Heating caused by corrosion or loosening of bolted connections would cause degradation of the tape covering detectable during a visual inspection.
6. FRCT phase bus enclosures provide enclosure protection only.
7. FRCT high voltage insulators *in the scope of license renewal above 34.5 kV will be periodically inspected under the Periodic Monitoring of Combustion Turbine Power Plant - Electrical (B.1.37) aging management program.*

8. FRCT high voltage insulators do not experience the mechanical wear identified in NUREG-1801. **See Oyster Creek LRA Subsection 3.6.2.2.5 for additional information.**
9. FRCT transmission conductor does not experience the aging effects identified in NUREG-1801. The evaluation provided in Oyster Creek LRA Subsection 3.6.2.2.6 is applicable to FRCT.

## **Enclosure 2**

### **Summary of Commitments Associated With Response to April 20, 2006 Request for Additional Information**

#### **Oyster Creek Generating Station License Renewal Application (TAC No. MC7624)**

**This Enclosure 2 is being resubmitted in its entirety, reflecting the clarifications delineated in Enclosure 1 and its Appendix A. Changes as a result of this supplement are designated by bolded and italicized text.**



## Enclosure 2

### Summary of Commitments

The following table identifies commitments made in this document. These items are described in more detail in Enclosure 1 of this submittal. Any other actions discussed in this submittal represent intended or planned actions. They are described to the NRC for the NRC's information and are not regulatory commitments. Changes to Oyster Creek license renewal commitment 43 as submitted in the 10/12/05 AmerGen response to NRC RAI 2.5.1.19-1 are highlighted by bolding. Commitment 64 is a commitment to implement a new program and is shown in bold print.

Commitment	Committed Date or Outage	One-Time Action (Yes/No)	Programmatic (Yes/No)
<p>43) Periodic Monitoring of Combustion Turbine Power Plant – Electrical</p> <p>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 10CFR50.59 Environmental Qualification Requirements program <b>and the new Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements program</b> 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; visual inspection of accessible phase bus and connections and phase bus insulators/supports; and <b>visual inspection of high voltage Insulators above 34.5 kV for salt build-up.</b> 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.</p>	Prior to period of extended operation	No	Yes

Commitment	Committed Date or Outage	One-Time Action (Yes/No)	Programmatic (Yes/No)
<p><b>64) Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements</b></p> <p><b>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 <i>within the scope of license renewal</i> 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.</b></p>	<p><b>Prior to period of extended operation</b></p>	<p><b>No</b></p>	<p><b>Yes</b></p>