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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: Reconciliation of Oyster Creek Generating Station License Renewal Application with September 2005 Revision 1 NUREG-1800 and NUREG -1801 (TAC No. MC 7624)

Reference: (1) "Application for Renewed Operating License," Oyster Creek Generating Station, dated July 22, 2005.

In Reference 1, AmerGen committed to review the Oyster Creek License Renewal Application (LRA) and submit an amendment, if necessary, to address any material changes resulting from the final guidance contained in the September 2005 Revision 1 NUREG-1800 and NUREG-1801 documents.

AmerGen has performed a reconciliation review of the Oyster Creek LRA vs. the specifications contained in the September 2005 Revision 1 NUREG-1800 and NUREG-1801 documents, and has identified a number of changes in the revised NUREG documents that affect the LRA. Detailed results of this review are documented in the Oyster Creek Generating Station License Renewal document, "Reconciliation of Program and Line Item Differences Between January 2005 Draft NUREG-1801 and September 2005 Revision 1 NUREG-1801, Revision 1," provided separately to the NRC. We are providing the attached tabulation, Enclosure 1, summarizing this review.

The Oyster Creek Generating Station License Renewal Application (LRA) was submitted to the NRC on July 22, 2005. The Aging Management Programs and activities contained in the LRA were structured to address the guidance provided in the Draft NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants", January 2005. Draft NUREG-1800 references Draft NUREG-1801, "Generic Aging Lessons Learned (GALL) Report", January 2005.

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Subsequently, NUREG-1800, Revision 1, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants" was published in September 2005, referencing NUREG-1801, Revision 1, "Generic Aging Lessons Learned (GALL) Report", published September 2005.

The Oyster Creek License Renewal Team reviewed the changes to NUREG-1800 and NUREG-1801, utilizing information provided by the NRC in NUREG-1832 and NUREG-1833. The Team first evaluated these changes to determine their applicability to the Oyster Creek LRA, and then evaluated the applicable changes to determine their impact on the Oyster Creek LRA. This review included identification and evaluation of:

1. Changes and additions to NUREG-1801 Aging Management Programs
2. Changes to NUREG-1801 Aging Management Review line Items used in the Oyster Creek LRA
3. Deletions of Aging Management Review line items from the Revision 1 NUREG-1801 that had been used in the Oyster Creek LRA
4. Additions of Aging Management Review line items to the Revision 1 NUREG-1801 that were not in the January 2005 Draft document and had not been used in the Oyster Creek LRA

Changes affecting the LRA are summarized in Enclosure 1.

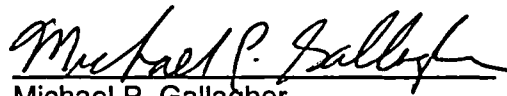
New commitments due to this review are identified in Enclosure 2.

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 03-30-2006

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

Enclosures: (1) Summary of Reconciliation of OC LRA to September 2005 Revision 1  
NUREG-1800 and NUREG-1801  
(2) Summary of Commitments

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

## Enclosure 1

**Summary of Reconciliation of OC LRA to September 2005 Revision 1  
NUREG-1800 and NUREG-1801  
Oyster Creek Generating Station  
License Renewal Application (TAC No. MC 7624)**

**1. Changes and Additions to Programs:**

**Program B.1.7 (XI.M7)  
Program B.1.16 (XI.M23)  
Program B.1.22 (XI.M30)  
Program B.1.24 (XI.M32)  
Program B.1.31 (XI.S6)  
Program B.1.36 (XI.E3)  
Program B.2.2 (plant-specific)  
Program B.2.4 (plant-specific)**

**2. Changes to Line Items Used in the OC LRA**

**AMR Line Item EP-34 (Rev. 1 SRP 3.2.1-10)  
AMR Line Item T-14 (Rev. 1 SRP 3.5.1-46)**

**3. Changes Due to Line Item Deletions**

**None**

**4. Additions of AMR Line Items in Revision 1 GALL**

**AMR Line Item AP-80 (Rev.1 SRP 3.3.1-52)  
AMR Line Item RP-25 (Rev.1 SRP 3.1.1-14)  
AMR Line Item RP-26 (Rev. 1 SRP 3.1.1-47)**

## **1. Changes and Additions to Programs:**

### **Program B.1.7 (XI.M7) BWR Stress Corrosion Cracking:**

The September 2005 Revision 1 GALL program deletes the specific reference to BWRVIP-29 for reactor coolant water chemistry. An exception was taken in the Oyster Creek LRA to BWRVIP-29 for this program; due to the GALL change, this exception no longer applies.

### **Program B.1.16 (XI.M23) Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems:**

The September 2005 Revision 1 GALL program deletes specifications for aging management of active components. An exception was taken in the Oyster Creek LRA to tracking the number and magnitude of lifts by the crane. Due to the GALL change, this exception no longer applies.

### **Program B.1.22 (XI.M30) Fuel Oil Chemistry:**

The September 2005 Revision 1 GALL program states that the fuel oil aging management program is in part based on the fuel oil purity and testing requirements of the plant's Technical Specifications that are based on the Standard Technical Specifications of NUREG-1430 through NUREG-1433. The January 2005 Draft did not invoke the Standard Technical Specifications. Oyster Creek has not adopted the Standard Technical Specifications as described in NUREG-1430 through NUREG-1433; however, the Oyster Creek fuel oil specifications and procedures invoke similar requirements for fuel oil purity and fuel oil testing as described by the Standard Technical Specifications. This is a new exception based on the reconciliation of this aging management program from the January 2005 draft GALL to the approved September 2005 Revision 1 GALL.

### **Program B.1.24 (XI.M32) One-Time Inspection:**

The September 2005 Revision 1 GALL program states that one-time inspection of Class 1 piping less than or equal to NPS 4 is addressed in Chapter XI.M35, One Time Inspection of ASME Code Class 1 Small Bore-Piping. NUREG-1801 aging management program XI.M35, One Time Inspection of ASME Code Class 1 Small Bore-Piping will not be used at Oyster Creek. The new Oyster Creek One-Time Inspection aging management program will include the one-time inspection of Class 1 piping less than NPS 4. This is a new exception based on the reconciliation of this aging management program from the January 2005 draft GALL to the approved September 2005 Revision 1 GALL.

The September 2005 Revision 1 GALL program specifies the 2001 ASME Section XI B&PV Code, including the 2002 and 2003 Addenda for Subsections IWB, IWC, and IWD. The current Oyster Creek ISI Program Plan for the fourth ten-year inspection interval effective from October 15, 2002 through October 14, 2012, approved per 10CFR50.55a, is based on the 1995 ASME Section XI B&PV Code, including 1996 addenda. The next 120-month inspection interval for Oyster Creek will incorporate the requirements specified in the version of the ASME Code incorporated into 10 CFR 50.55a twelve months before the start of the inspection interval. While this exception has already been taken in the Oyster Creek LRA for the B.1.1 (XI.M1) ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program, this is a new exception for Oyster Creek program B.1.24 based on the reconciliation of this aging management program from the January 2005 draft GALL to the approved September 2005 Revision 1 GALL.

The September 2005 Revision 1 GALL program XI.M35 states that the guidelines of EPRI Report 1000701, "Interim Thermal Fatigue Management Guideline (MRP-24)," January 2001 should be used for identifying piping susceptible to potential effects of thermal fatigue. EPRI Report 1000701 recommends specific locations for assessment and/or inspection where cracking and leakage has been identified in nominally stagnant non-isolable piping attached to reactor coolant systems in domestic and similar foreign PWRs. As Oyster Creek is a BWR, these inspection guidelines are not applicable. This is a new exception based on the reconciliation of this aging management program from the January 2005 draft GALL to the approved September 2005 Revision 1 GALL. Although the guidelines of EPRI Report 1000701 are not applicable to Oyster Creek, the potential for cracking in nominally stagnant non-isolable piping attached to reactor coolant systems was reviewed for Oyster Creek and it was concluded that there are no systems with unisolable sections that could be subjected to thermal stratification or oscillations. This evaluation is summarized as follows: Information Notice (IN) 97-46 discusses a situation that occurred at Oconee Unit 2 where cracks developed in an unisolable section of a combined makeup (MU) and high-pressure injection (HPI) line. The Information Notice goes on to reference NRC Bulletin 88-08 and its supplements. Bulletin 88-08 describes the circumstances that occurred at Farley 2 where a crack developed in an unisolable section of ECCS piping. The crack resulted from high cycle thermal fatigue caused by relatively cold water leaking through a closed globe valve. Oyster Creek performed a review of systems connected to the Reactor Coolant System in response to NRC Bulletin 88-08 and its Supplements to determine whether unisolable sections of piping connected to the Reactor Coolant System could be subjected to stresses from temperature stratification or temperature oscillations. It was concluded that there are no systems with unisolable sections which could be subjected to thermal stratification or oscillations. The piping system evaluations encompassed both the weldments (as required by Bulletin 88-08) and the base metal (as required by Supplement 1 to Bulletin 88-08).

**Program B.1.31 (XI.S6) Structures Monitoring Program:**

There are no changes for structures; however, Oyster Creek credits the Structures Monitoring Program for managing the aging effects of external surfaces of mechanical components, which are covered by new GALL program XI.M36, External Surfaces:

The September 2005 Revision 1 GALL program XI.M36 states that monitoring of external surfaces of mechanical components is performed every refueling cycle. Oyster Creek performs this monitoring every 4 years. Technical basis for this exception is as follows:

- The frequency of 4 years specified for monitoring of exterior surfaces of mechanical components is consistent with the frequency specified for exterior surfaces of supporting structures. The 4-year frequency is consistent with industry guidelines and has proven effective in detecting loss of material due to corrosion, and change in material properties of structural elastomers on exterior surfaces of structures. Consequently this frequency will also be effective for detecting loss of material and change in material properties on exterior surfaces of mechanical components before an intended function is impacted.
- Industry and plant-specific operating experience review has not identified any instances of significant loss of material or change in material properties of external surfaces of mechanical components subject to indoor air environment.
- Mechanical components subject to outdoor air are constructed from stainless steel and aluminum, which are not susceptible to accelerated corrosion, or carbon steel components protected by protective coatings such as galvanization or painting. Plant operating experience indicates that monitoring of exterior surfaces of components made of these materials and protective coatings on a

frequency of 4 years provides reasonable assurance that loss of material will be detected before an intended function is affected.

- Studies by EPRI provide corrosion rate curve for carbon steels. This curve was constructed from 55 individual tests representing at least five different steels and six different test locations and environments. The curve shows 0.926 mils per year thickness loss during the first 1 1/2 years, decreasing to 0.21 mils per year after 15 1/2 years. EPRI also conducted corrosion tests of ASTM A-36 structural steel at four nuclear plants located in Elma and Richland, Washington; and Midland, Michigan. The tests were conducted for up to 24 months. EPRI concluded that based on the test results the corrosion rate is 0.5 mils per year. If the corrosion rate is conservatively taken as 0.926 mils per year, then the loss of material projected for 4 years is less than 4 mils. This loss of material is insignificant and will not impact the intended function of mechanical components.

This is a new exception based on the reconciliation of this aging management program from the January 2005 draft GALL to the approved September 2005 Revision 1 GALL.

The September 2005 Revision 1 GALL program specifies monitoring for leakage. The Oyster Creek 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). This is a new enhancement based on the reconciliation of this aging management program from the January 2005 draft GALL to the approved September 2005 Revision 1 GALL, and will be added to the Table A.5 License Renewal Commitment List Item No. 31.

**Program B.1.36 (XI.E3) Inaccessible Medium-Voltage Cables not Subject to 10 CFR 50.49 Environmental Qualification Requirements:**

The September 2005 Revision 1 GALL defines medium voltage as 2kV – 35kV. The previous versions of GALL did not define medium voltage. The Oyster Creek LRA submitted a B.1.36 program that included 2.4 and 4.16kV cables. This scope was expanded to include 13.8kV cables with the 10/12/05 RAI response for the Forked River Combustion Turbine. OC is planning to include both 13.8 and 34.5kV cables in its existing cable test program that currently only includes 2.4 and 4.16kV cables. This is a new enhancement based on the reconciliation of this aging management program from the January 2005 draft GALL to the approved September 2005 Revision 1 GALL, and will be added to the Table A.5 License Renewal Commitment List Item No. 36.

**Program B.2.2 (plant-specific) Lubricating Oil Monitoring Activities:**

The September 2005 Revision 1 GALL added new aging management program XI.M39, Lubricating Oil Analysis, which will not be used at Oyster Creek. The Oyster Creek aging management program B.2.2, Lubricating Oil Monitoring Activities will incorporate the specifications of GALL program XI.M39 with the following exception and enhancement: The new program in September 2005 GALL specifies that flash point be measured for all lubricating oils. Oyster creek will sample and measure flash point for lubricating oil for diesel engines only. Justification for this is as follows: flash point is a quality control measurement when purchasing new oil. It is not a primary measurement to determine the presence of water or contaminants, which are the parameters for assessing the environment of concern. Measurement of flash point is a measure to detect the contamination of lubricating oils by fuel oil, as is the case for diesel engines lubricating oil. Therefore, flash point is measured for diesel engine lubricating oils only. This is a new exception based on the reconciliation of this aging management program from the January 2005 draft GALL to the approved September 2005 Revision 1 GALL.

The Oyster Creek program will be enhanced to include sampling and measurement of flash point of diesel engine lubricating oil to detect contamination of lubricating oil by fuel oil. This is a new enhancement based on the reconciliation of this aging management program from the January 2005 draft GALL to the approved September 2005 Revision 1 GALL, and will be added to the Table A.5 License Renewal Commitment List Item No. 38.

**Program B.2.4 (plant-specific) Periodic Inspection of Ventilation Systems:**

The September 2005 Revision 1 GALL added new aging management program XI.M38, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components, which will not be used at the Oyster Creek station, but is used for the Forked River Combustion Turbine site. The Oyster Creek aging management program B.2.4, Periodic Inspection of Ventilation Systems incorporates the specifications of GALL program XI.M38, with the exception of inspection of coatings. The Oyster Creek B.2.4 program does not take credit for coatings of internal surfaces, but directly inspects for loss of material. The Oyster Creek program is enhanced to provide specific guidance to inspect for Loss of Material by inspecting for corrosion, rust, pitting or wear, and for Change in Material Properties by inspecting for cracking, perforations, or other damage. These enhancements were part of the Oyster Creek LRA submitted in July 2005, and are not due to reconciliation of this aging management program from the January 2005 draft GALL to the approved September 2005 Revision 1 GALL.



## 2. Changes to Line Items Used in the OC LRA

The following change to the Oyster Creek LRA aging management review was required due to reconciliation of changes to line items that did not require further evaluation in the January 2005 draft GALL, but do require further evaluation in the approved September 2005 Revision 1 GALL:

### EP-34 (V.D2-10, Draft SRP Item No. 3.2.1-24; Rev. 1 SRP Item No. 3.2.1-10):

This line item for stainless steel heat exchanger tubes in treated water, addressing reduction of heat transfer due to fouling, invoked the Water Chemistry program with "No" further evaluation required in the January 2005 draft GALL. It has been changed in the September 2005 Revision 1 GALL to Water Chemistry and One-Time Inspection, with "Yes" for evaluation of aging effects. There are 2 instances of this line item being used in the Oyster Creek License Renewal Application, both in the Isolation Condenser system, for heat exchanger tubes, internal and external. The Oyster Creek LRA will add two line items for one-time inspection of the internal and external surfaces of the isolation condenser tube for reduction of heat transfer due to fouling. These are new additions based on the reconciliation of the Oyster Creek LRA between the January 2005 draft GALL and the approved September 2005 Revision 1 GALL.

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Isolation Condensers	Heat Transfer	Stainless Steel (Tubes)	Treated Water (Internal)	Reduction of Heat Transfer	One-Time Inspection (B.1.24)	EP-34	Rev.1 SRP 3.2.1-10	Revised Rev.1 SRP Item
Isolation Condensers	Heat Transfer	Stainless Steel (Tubes)	Treated Water < 140F (External)	Reduction of Heat Transfer	One-Time Inspection (B.1.24)	EP-34	Rev.1 SRP 3.2.1-10	Revised Rev.1 SRP Item

The following change to the Oyster Creek LRA aging management review was required due to reconciliation of changes to line items that were not administrative changes:

### T-14 (III.A5-13, Draft SRP Item No. 3.5.1-25; Rev. 1 SRP Item No. 3.5.1-46):

Oyster creek will commit to perform monitoring of any leakage from the spent fuel pool liner via the pool leak chase piping. This will be added to the Table A.5 License Renewal Commitment List as Item No. 62.

### 3. Changes Due to Line Item Deletions

None

Twenty (20) line items used in the OCLR LRA were deleted from the September 2005 Revision 1 GALL documents. No material changes to the LRA resulted from these GALL line item deletions.

### 4. Additions of AMR Line Items in Revision 1 GALL

The following changes to the Oyster Creek LRA aging management review were required due to reconciliation of new line items added to the September 2005 Revision 1 NUREG 1801 document that were not included in the January 2005 Draft NUREG-1801, and consequently were not addressed in the Oyster Creek LRA submittal:

#### AP-80 (Revision 1 SRP Item No. 3.3.1-52):

This material and environment combination of copper alloy heat exchanger tubes in closed cooling water with the aging effect and mechanism of reduction of heat transfer due to fouling is addressed in the Oyster Creek LRA submittal with the Closed-Cycle Cooling Water System program (B.1.14) for the shutdown cooling pump seal coolers. This was invoked by a non-GALL line item, as this aging effect was not in the January 2005 Draft GALL for this component, material, and environment combination. This is in accordance with the requirements of September 2005 Revision 1 GALL for new line item AP-80. In the Oyster Creek LRA submittal, the Emergency Diesel Generator and Auxiliary System brass lube oil cooler and radiator tubes exposed to a closed cooling water environment do not include the Reduction of Heat Transfer aging effect in the Oyster Creek LRA submittal, based on EPRI Mechanical Tools Appendix G. In EPRI Mechanical Tools Appendix G, fouling is not identified as a significant aging effect for copper alloy heat exchangers in a closed cooling water environment. In order for this component to be in accordance with this new GALL line item, reduction of heat transfer due to fouling, and the Closed-Cycle Cooling Water System program (B.1.14), will be added to the brass lube oil cooler and radiator tubes exposed to a closed cooling water environment in the Emergency Diesel Generator and Auxiliary System AMR.

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchanger (Lube Oil Cooler)	Heat Transfer	Brass (tubes)	Closed Cooling Water (Internal)	Reduction of Heat Transfer	Closed-Cycle Cooling Water System (B.1.14)	AP-80	Rev.1 SRP 3.3.1-52	New Rev.1 SRP Item
Heat Exchanger (Radiator)	Heat Transfer	Brass (tubes)	Closed Cooling Water (Internal)	Reduction of Heat Transfer	Closed-Cycle Cooling Water System (B.1.14)	AP-80	Rev.1 SRP 3.3.1-52	New Rev.1 SRP Item

**RP-25 (Revision 1 SRP Item No. 3.1.1-14):**

The specifications of new line item RP-25 will be addressed as follows: The aging effect of loss of material due to pitting and crevice corrosion in reactor vessel flanges, nozzles, penetrations, safe ends, vessel shell, heads and welds will be managed through the use of the Water Chemistry and One-Time Inspection programs. The selection of susceptible locations for one-time inspection will be based on severity of conditions, time of service, and lowest design margin.

Following is an example of the new line item:

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Nozzles	Pressure Boundary	Carbon and low alloy steel	Loss of material	Loss of material	Water Chemistry (B.1.2)	RP-25	Rev.1 SRP 3.1.1-14	New Rev.1 SRP Item
Nozzles	Pressure Boundary	Carbon and low alloy steel	Loss of material	Loss of material	One-Time Inspection (B.1.24)	RP-25	Rev.1 SRP 3.1.1-14	New Rev.1 SRP Item

**RP-26 (Revision 1 SRP Item No. 3.1.1-47):**

The specifications of new line item RP-26 will be addressed as follows: The BWR Vessel Internals program (B.1.9) is used in the Oyster Creek LRA for aging management of the reactor vessel internals components. The Oyster Creek LRA credits this program for managing cracking initiation and growth in reactor internal components.

Following is an example of the new line item:

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Reactor Internal Component	Pressure Boundary	Stainless Steel	Treated Water	Loss of material	BWR Vessel Internals (B.1.9)	RP-26	Rev.1 SRP 3.1.1-47	New Rev.1 SRP Item

**Enclosure 2**

**Summary of Commitments**

### Summary of Commitments

The following table identifies commitments made in this document. Any other actions discussed in the submittal represent intended or planned actions. They are described to the NRC for the NRC's information and are not regulatory commitments.

Commitment	Committed Date or Outage	One-Time Action (Yes/No)	Programmatic (Yes/No)
1. AmerGen will enhance Oyster Creek Program B.1.31 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). This is an addition to the Table A.5 License Renewal Commitment List Item No. 31.	Prior to period of extended operation	No	Yes
2. AmerGen will enhance Oyster Creek Program B.1.36 to include both 13.8 and 34.5kV cables in its existing cable test program that currently only includes 2.4 and 4.16kV cables. This is an addition to the Table A.5 License Renewal Commitment List Item No. 36.	Prior to period of extended operation	No	Yes
3. AmerGen 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. This is an addition to the Table A.5 License Renewal Commitment List Item No. 38.	Prior to period of extended operation	No	Yes
4. AmerGen will commit to perform monitoring of any leakage from the spent fuel pool liner via the pool leak chase piping. This is new Table A.5 License Renewal Commitment List Item No. 62.	Prior to period of extended operation	No	Yes