Reconciliation of Program and Line Item Differences Between January 2005 Draft NUREG-1801 and September 2005 Revision 1 NUREG-1801

Revision 1

Oyster Creek Generating Station

License Renewal

Approval Page

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REVISION SUMMARY

Rev	Required Changes to Achieve Revision
0	N/A (Initial Issue)
1	Added Attachment 7, Evaluation of New Line Items; Revised Sections 1.0, 2.0, 3.0, 4.0, and 6.0 to address evaluation of new line items from September 2005 Revision 1 of NUREG-1801; Corrected typo in NUREG number in Section 4.0, Program B.1.22; Corrected NPS size wording in Section 4.0, Program B.1.24; Attachment 2.1; Revised Attachment 3 to add detail to the AP-62 discussion
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1.0 Purpose

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.

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 purpose of this document is to identify and reconcile differences between the January 2005 Draft GALL Aging Management Programs and Aging Management Review (AMR) line items used in the Oyster Creek LRA, with those in the September 2005 Revision 1 GALL. Differences that result in required changes to the LRA will be incorporated in updates to the application, in accordance with the requirements of 10 CFR 54.

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:

- Changes and additions to NUREG-1801 Aging Management Programs
- Changes to NUREG-1801 Aging Management Review line Items used in the Oyster Creek LRA
- Deletions of Aging Management Review line items from the Revision 1 NUREG-1801 that had been used in the Oyster Creek LRA
- 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

The specifics of this review and evaluation are presented in Section 2.0, Scope, below. Changes determined to be administrative in nature were deemed to not materially affect the contents of the LRA, and were not included in the scope of this document.

2.0 Scope

The scope of this document is as follows:

- Summarize in tabular form changes or additions to the Aging Management Programs (AMPs) from the September 2005 Revision 1 GALL, with technical assessments of the differences and impact on the Oyster Creek LRA, if any.
- Review new September 2005 Revision 1 GALL AMPs potentially applicable to the Oyster Creek LRA, and evaluate the ability of the AMPs used in the Oyster Creek LRA to satisfy the specifications of the new Revision 1 GALL AMPs.
- Evaluate changes to GALL AMR line items found in the September 2005 Revision 1 GALL from those in the January 2005 Draft GALL, and determine whether those changes affect

the Oyster Creek LRA's use of the GALL AMR line items. This activity contains three categories:

1. AMR line items used in the Oyster Creek LRA that require further evaluation in the September 2005 Revision 1 GALL, but did not require further evaluation in the January 2005 Draft GALL
2. AMR line items that were contained in the January 2005 Draft GALL and were used in the Oyster Creek LRA, but have since been deleted from the September 2005 Revision 1 GALL
3. Other AMR line items from the January 2005 Draft GALL used in the Oyster Creek LRA that contain non-administrative differences in the September 2005 Revision 1 GALL

- For line items used in the Oyster Creek LRA that invoked plant specific programs which require further evaluation in both the January 2005 Draft GALL and the September 2005 Revision 1 GALL, review the applicable referenced sections in both corresponding versions of NUREG-1800 (SRP) for changes, and determine any impact on the OC LRA.
- Review new GALL AMR line items added to the September 2005 Revision 1 GALL that were not included in the January 2005 Draft GALL document and consequently were not included in the Oyster Creek LRA, and evaluate for applicability to Oyster Creek.

For line items used in the Oyster Creek LRA that invoked GALL programs (non-plant specific) which required further evaluation in both the January 2005 Draft SRP and September 2005 Revision 1 SRP, the applicable referenced sections of the SRP were spot-checked for changes to ascertain whether new or revised further evaluations of GALL program results were specified. No changes to the SRP further evaluation sections that required change to Oyster Creek GALL-based aging management programs were noted in the spot-check. It was concluded that changes associated with the SRP sections concerning further evaluation of GALL programs would be evident during the evaluation of changes to the GALL programs, and any effect on the OC LRA would be identified as part of that review. Consequently, comprehensive review of the SRP sections for further evaluation of GALL programs was not included in the scope of this evaluation.

3.0 Methodology

The September 2005 Revision 1 GALL AMPs applicable to the Oyster Creek LRA were reviewed and compared with the January 2005 Draft GALL version. Applicable differences potentially significant to the OC LRA (i.e., did not consist solely of administrative changes) were identified and summarized in the table, along with a technical assessment of the significance of the change, and whether the OC LRA was affected by the change. Reference **Attachment 1.**

September 2005 Revision 1 GALL included six (6) new AMPs that were not contained in the January 2005 Draft GALL. Two of these new programs, XI.M11A, "Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Heads of Pressurized Water Reactors," and XI.M37, "Flux Thimble Tube Inspection," are applicable only to pressurized water reactors and therefore not applicable to Oyster Creek. The remaining four programs, XI.M35, "One-Time Inspection of ASME Code Class 1 Small-Bore Piping," XI.M36, "External Surfaces Monitoring," XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components," and XI.M39, "Lubricating Oil Analysis," were evaluated and compared with the corresponding AMPs used in the Oyster Creek LRA. The comparison was made on an element-by-element basis, with resulting conclusions as to the equivalency of the AMP used by the Oyster Creek LRA. These evaluations are found in **Attachment 2.**

Note: Portions of the Oyster Creek Generating Station License Renewal Application not submitted with the original application on July 22, 2005 (i.e., those concerning the Meteorological Tower and the Forked River Combustion Turbines) were developed using the applicable September 2005 Revision 1 GALL AMPs. Except for Structures Monitoring, the AMPs used for these portions of the LRA do not require reconciliation between the versions in the January 2005 Draft GALL and September 2005 Revision 1 GALL. The Oyster Creek B.1.31 XI.S6 Structures Monitoring Program is used (in lieu of the Revision 1 GALL program External Surfaces Monitoring) for all portions of the Oyster Creek LRA. See Attachment 2.2.

The AMRs defined in Volume 2 of GALL present acceptable methods of managing aging effects. Each AMR line item from the GALL report identifies the component, material, environment, and aging effect, along with the corresponding aging management program. A unique AMR line item may be used multiple times. The September 2005 Revision 1 GALL incorporated changes to some of the AMR line items. NUREG-1832, "Analysis of Public Comments on the Revised License Renewal Guidance Documents", September 2005, Appendix E, "Aging Management Review Line-Item Comparison" provides a "before and after" presentation of the AMR line items for evaluation. Three categories of changes to AMR line items used in the Oyster Creek LRA (from the January 2005 Draft GALL) were identified:

1. AMR line items used in the Oyster Creek LRA that require further evaluation in the September 2005 Revision 1 GALL, but did not require further evaluation in the January 2005 Draft GALL.

   Nineteen (19) line items used in the Oyster Creek LRA which did not require further evaluation in the January 2005 Draft GALL, now list a "Yes" in the further evaluation column in the tables found in Volume 2 of the September 2005 Revision 1 GALL. These changes were evaluated for their effect on the OC LRA, if any. The results are included in **Attachment 3.**

2. AMR line items that were contained in the January 2005 Draft GALL and were used in the Oyster Creek LRA, but have since been deleted from the September 2005 Revision 1 GALL.

   Twenty (20) line items used in the Oyster Creek LRA that were included in the January 2005 Draft GALL have been deleted from Volume 2 of the September 2005 Revision 1 GALL. For fifteen (15) of these line items, the GALL Master List addresses the reasoning behind the deletion and lists an equivalent or replacement line item. The twenty line item deletions were evaluated for their effect on the OC LRA, if any. The results are included in **Attachment 4.**

3. Other AMR line items from the January 2005 Draft GALL used in the Oyster Creek LRA that contain non-administrative differences in the September 2005 Revision 1 GALL.

   Forty-One (41) line items from the January 2005 Draft GALL that were used in the Oyster Creek LRA were identified to have had non-administrative changes made to them in the September 2005 Revision 1 GALL. These line items were not captured in the first category above (i.e., "further evaluation" did not change). These changes typically contain a technical difference, e.g., address an additional aging effect or invoke a new or different program. These changes were evaluated for their effect on the OC LRA, if any. The results are included in **Attachment 5.**

Eighteen (18) line items used in the Oyster Creek LRA invoked plant specific programs which require further evaluation in both the January 2005 Draft NUREG-1800 (SRP) and the September 2005 Revision 1 SRP. The applicable referenced sections in both versions of the SRP were reviewed for changes that may have necessitated new evaluations of a plant specific aging

management program to ensure that aging effects are adequately managed. This review concluded that there were no significant changes to the SRP sections, and that new evaluations were not required. The results are included in **Attachment 6.**

Eighty-eight (88) line items were added to the September 2005 Revision 1 NUREG-1801 that were not included in the January 2005 Draft NUREG-1801. Consequently, these items were not addressed in the Oyster Creek LRA submitted in July 2005. These added AMR line items were reviewed and evaluated for applicability to Oyster Creek. The results are included in **Attachment 7.**

4.0 Conclusion

The following changes to the Oyster Creek LRA aging management programs were required due to reconciliation between the January 2005 draft GALL and the approved September 2005 Revision 1 GALL:

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 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.

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 provided in Attachment 2.2. 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.

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.

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 provided in Attachment 2.4. 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 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.

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.

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, 3.2.1) -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 and 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.

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) – Oyster creek will commit to perform monitoring of any leakage from the spent fuel pool liner via the pool leak chase piping.

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, its addition to the Emergency Diesel Generator and Auxiliary System AMR is required.

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 though 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.

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.

5.0 References

1. Draft NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants", January 2005
2. NUREG-1800, Revision 1, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants", September 2005
3. Draft NUREG-1801, "Generic Aging Lessons Learned (GALL) Report", January 2005
4. NUREG-1801, Revision 1, "Generic Aging Lessons Learned (GALL) Report", September 2005
5. NUREG-1832, "Analysis of Public Comments on the Revised License Renewal Guidance Documents", September 2005
6. NUREG-1833, "Technical Bases for Revision to the License Renewal Guidance Documents", October 2005
7. Oyster Creek Generating Station License Renewal Application, July 2005

6.0 Attachments

Attachment 1: Table 1 – Oyster Creek License Renewal GALL Program Comparison – January 2005 Draft to September 2005 Revision 1

Attachment 2: New Aging Management Programs in September 2005 Revision 1 GALL vs. Corresponding Programs Used in the Oyster Creek LRA

Attachment 3: AMR Line Items used in the Oyster Creek LRA for which "Further Evaluation" changed from "No" to "Yes" in the September 2005 Revision 1 GALL

Attachment 4: AMR Line Items used in the Oyster Creek LRA which were Deleted from the September 2005 Revision 1 GALL

Attachment 5: AMR Line Items used in the Oyster Creek LRA for which Changes in the September 2005 Revision 1 GALL were not solely Administrative

Attachment 6: AMR Line Items used in the Oyster Creek LRA which invoke Plant-Specific Programs Requiring Further Evaluation in both the January 2005 Draft and September 2005 Revision 1 SRP

Attachment 7: Evaluation of AMR Line Items Added by the September 2005 Revision 1 GALL (Items not previously included in the January 2005 Draft GALL)

Attachment 1

Table 1

Oyster Creek License Renewal GALL Program Comparison
January 2005 Draft GALL to September 2005 Revision 1
GALL

GALL Program Comparison – January 2005 Draft to September 2005 Rev. 1

Comparison of the January Draft and September Revision 1 of NUREG-1801 revealed both editorial and technical revisions, and that 6 new programs were added.

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
B.1.1	XI.M1	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD	1. Editorial changes. 2. Clarification of the GALL position on acceptable date of ASME Code used, relative to 10CFR50.55a has been provided.	1. Editorial changes do not affect the technical assessment performed for Oyster Creek for this program. 2. Although NUREG-1801 specifies the 2001 edition including the 2002 and 2003 Addenda of the ASME Section XI Code, Subsections IWB, IWC, and IWD for inspection, repair, and replacement, it allows an applicant to rely on a different version of the ASME Code providing it is justified. Oyster Creek's current ISI program plan for the fourth ten-year inspection interval, approved per 10 CFR 50.55a, is based on the 1995 edition 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.	No
B.1.2	XI.M2	Water Chemistry	1. Editorial changes. 2. Clarifications have been provided on industry document revisions.	1. Editorial changes do not affect the technical assessment performed for Oyster Creek for this program. 2. Clarifications provided on industry document revisions do not affect BWRs and, therefore, have no effect on the technical assessment performed for Oyster Creek for this program.	No
B.1.3	XI.M3	Reactor Head Closure Studs	1. Editorial changes. 2. Clarification of the GALL position on acceptable date of ASME Code used, relative to 10CFR50.55a has been provided.	1. Editorial changes do not affect the technical assessment performed for Oyster Creek for this program. 2. Although NUREG-1801 specifies the 2001 edition including the 2002 and 2003 Addenda of the ASME Section XI Code, Subsections IWB, IWC, and IWD for inspection, repair, and replacement, it allows an applicant to rely on a different version of the ASME Code providing it is justified. Oyster Creek's current ISI program plan for the fourth ten-year	No

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
				inspection interval, approved per 10 CFR 50.55a, is based on the 1995 edition 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.	
B.1.4	XI.M4	BWR Vessel ID Attachment Welds	1. Editorial changes. 2. Clarification of the GALL position on acceptable date of ASME Code used, relative to 10CFR50.55a has been provided. 3. Added the specification that relief requests must be submitted and approved.	1. Editorial changes do not affect the technical assessment performed for Oyster Creek for this program. 2. Although NUREG-1801 specifies the 2001 edition including the 2002 and 2003 Addenda of the ASME Section XI Code, Subsections IWB, IWC, and IWD for inspection, repair, and replacement, it allows an applicant to rely on a different version of the ASME Code providing it is justified. Oyster Creek's current ISI program plan for the fourth ten-year inspection interval, approved per 10 CFR 50.55a, is based on the 1995 edition 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. 3. No inspection relief has been requested by Oyster Creek.	No
B.1.5	XI.M5	BWR Feedwater Nozzle	1. Editorial changes. 2. Clarification of the GALL position on acceptable date of ASME Code used, relative to 10CFR50.55a has been provided.	1. Editorial changes do not affect the technical assessment performed for Oyster Creek for this program. 2. Although NUREG-1801 specifies the 2001 edition including the 2002 and 2003 Addenda of the ASME Section XI Code, Subsections IWB, IWC, and IWD for inspection, repair, and replacement, it allows an applicant to rely on a different version of the ASME Code providing it is justified. Oyster Creek's current ISI program plan for the fourth ten-year inspection interval, approved per 10 CFR 50.55a, is based on the 1995 edition including 1996 Addenda. The next 120-	No

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
				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.	
B.1.6	XI.M6	BWR Control Rod Drive Return Line Nozzle	1. Editorial changes. 2. Clarification of the GALL position on acceptable date of ASME Code used, relative to 10CFR50.55a has been provided.	1. Editorial changes do not affect the technical assessment performed for Oyster Creek for this program. 2. Although NUREG-1801 specifies the 2001 edition including the 2002 and 2003 Addenda of the ASME Section XI Code, Subsections IWB, IWC, and IWD for inspection, repair, and replacement, it allows an applicant to rely on a different version of the ASME Code providing it is justified. Oyster Creek's current ISI program plan for the fourth ten-year inspection interval, approved per 10 CFR 50.55a, is based on the 1995 edition 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.	No
B.1.7	XI.M7	BWR Stress Corrosion Cracking	1. Editorial changes. 2. The program description and scope of the program was revised to include nickel based alloy components. 3. The specific reference to BWRVIP-29 for reactor coolant water chemistry control was deleted.	1. Editorial changes do not affect the technical assessment performed for Oyster Creek for this program. 2. Nickel based alloy structures and/or components have been identified in the Oyster Creek LRA for the Reactor Pressure Vessel (RP-03, R-04, R-64, R-68, R-69), Reactor Internals (R-53, R-96), and Emergency Service Water System (AP-16, AP-53) license renewal systems. The addition of nickel based alloy components to the scope of the BWR Stress Corrosion Cracking program does not affect the programs selected for these components as identified in the Oyster Creek LRA. The only GALL item referenced above invoking the BWR Stress Corrosion Cracking program in the September 2005 version of GALL is R-68.	Yes. An exception was taken in the LRA to BWRVIP-29 for program B.1.7. This exception no longer applies to B.1.7.

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
				GALL item R-68 included the reference to the BWR Stress Corrosion Cracking program in the Draft January 2005 version of GALL. Therefore, this change to XI.M7 has no effect on the Oyster Creek LRA. 3. The specific reference to BWRVIP-29 was deleted from XI.M7 but the reference to Water Chemistry program XI.M2, which specifies BWRVIP-29, remained.	
B.1.8	XI.M8	BWR Penetrations	1. Editorial changes. 2. Clarification of the GALL position on acceptable date of ASME Code used, relative to 10CFR50.55a has been provided.	1. Editorial changes do not affect the technical assessment performed for Oyster Creek for this program. 2. Although NUREG-1801 specifies the 2001 edition including the 2002 and 2003 Addenda of the ASME Section XI Code, Subsections IWB, IWC, and IWD for inspection, repair, and replacement, it allows an applicant to rely on a different version of the ASME Code providing it is justified. Oyster Creek's current ISI program plan for the fourth ten-year inspection interval, approved per 10 CFR 50.55a, is based on the 1995 edition 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.	No
B.1.9	XI.M9	BWR Vessel Internals	1. Added the specification that for plants that have not yet reached a fluence of 5E+20 threshold for IASCC prior to POE, that the 5% & 10% inspection requirement is to begin once threshold is reached. Additionally, clarification added that the extent of the examination and its frequency would be based on a ten percent sample of the total population, which includes all grid beam and beam-to-beam crevice slots. 2. Clarification of the GALL position on acceptable date of ASME Code used, relative to 10CFR50.55a has been provided.	1. No new specifications. OC has already reached the threshold and has committed to these inspection requirements in the LRA. 2. Although NUREG-1801 specifies the 2001 edition including the 2002 and 2003 Addenda of the ASME Section XI Code, Subsections IWB, IWC, and IWD for inspection, repair, and replacement, it allows an applicant to rely on a different version of the ASME Code providing it is justified. Oyster Creek's current ISI program plan for the fourth ten-year inspection interval, approved per 10 CFR 50.55a, is based on the 1995 edition including 1996 Addenda. The next 120-	No

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
				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.	
N/A	XI.M10	Boric Acid Corrosion	Program not used at Oyster Creek.	N/A	No
N/A	XI.M11	Nickel-Alloy Nozzles and Penetrations	Program not used at Oyster Creek.	N/A	No
N/A	XI.M11A	Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Heads of Pressurized Water Reactors	Program not used at Oyster Creek.	N/A	No
N/A	XI.M12	Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS)	Program not used at Oyster Creek.	N/A	No
B.1.10	XI.M13	Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS)	Editorial changes.	Editorial changes do not affect the technical assessment performed for Oyster Creek for this program.	No
N/A	XI.M14	Loose Part Monitoring	Program not used at Oyster Creek.	N/A	No
N/A	XI.M15	Neutron Noise Monitoring	Program not used at Oyster Creek.	N/A	No
N/A	XI.M16	PWR Vessel Internals	Program not used at Oyster Creek.	N/A	No
B.1.11	XI.M17	Flow-Accelerated Corrosion	Editorial Changes.	Editorial changes do not affect the technical assessment performed for Oyster Creek for this program.	No
B.1.12	XI.M18	Bolting Integrity	1. Editorial Changes. 2. Element 1 – added "non-safety-related	1. Editorial changes do not affect the technical assessment performed for	No

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
			bolting." a. Added descriptor to structural bolting b. Added pointer to XI.M3 for reactor head closure bolts. c. Added reference to 1995 edition of ASME Code Section XI. 3. Element 2 – deleted reference to "Hot Torquing". Added reference to EPRI documents for maintenance practices 4. Element 3 – Added additional monitoring for safety related pressure retaining components such as leakage and loss of prestress a. Added loss of material and cracking to high strength bolts. 5. Element 4 – Removed reference to Section XI 1995 edition through 1996 addenda and added "endorsed in 10CFR50.55a(b)(2). a. Added reference to Category "D-B" and "Class 3". b. For high strength structural bolting added reference to stress corrosion cracking (SCC). 6. Element 7 – Dropped reference to Repair. a. For NSSS component support bolting added replacement IAW EPRI NP-5769 7. Element 10 – Added statement about downcomer tee-quencher bolting and reactor building closed cooling system bolting leakage.	Oyster Creek for this program. 2. No impact. 3. No impact. 4. Already included – No Impact. 5. Already included – No Impact. 6. Already included – No Impact. 7. No impact.	
N/A	XI.M19	Steam Generator Tube Integrity	Program not used at Oyster Creek.	N/A	No
B.1.13	XI.M20	Open-Cycle Cooling Water System	Added elastomers to the list of items periodically inspected, monitored, or tested.	The elastomers identified in the ESW and SW systems that are exposed to Raw Water-Salt Water are periodically inspected as part of the Periodic Inspection Program (B.2.5).	No
B.1.14	XI.M21	Closed-Cycle	1. Editorial changes.	1. Editorial changes do not affect the	No

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
		Cooling Water System	2. Added SCC as an aging mechanism to be managed by the Program. 3. In "Monitoring and Trending" added "Tests to evaluate heat removal capability of the system and degradation of system components may also be used" AND "internal inspections" to demonstrate system operability and confirm the effectiveness of the program. 4. Deleted the specification to comply specifically with TR-107306.	technical assessment performed for Oyster Creek for this program. 2. Oyster Creek chemistry control and heat exchanger design precludes cracking. 3. The CCCW program performs internal inspections and other tests to evaluate heat removal capability. 4. No technical impact as a result of the removal of the reference. The exception taken in the LRA still applies to the program.	
B.1.15	XI.M22	Boraflex Monitoring	Editorial changes.	Editorial changes do not affect the technical assessment performed for Oyster Creek for this program.	No
B.1.16	XI.M23	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems	1. All specifications and references to testing of active components were removed i.e., deleted from Program Description: "These cranes comply with the Maintenance Rule requirements provided in 10 CFR 50.65. The Nuclear Regulatory Commission Regulatory Guide (RG) 1.160 provides guidance for monitoring the effectiveness of maintenance at nuclear power plants." 2. Deleted from Parameters Monitored/Inspected: "The number and magnitude of lifts made by the crane are also reviewed." 3. Deleted from Detection of Aging Effect: "Functional tests are also performed to assure their integrity." 4. Deleted from Acceptance Criteria: "EOCI Specification #61 (or later revisions)," 5. Deleted from Operating Experience: "Because of the requirements for monitoring the effectiveness of maintenance at nuclear power plants provided in 10 CFR 50.65"	(1-5) These changes appropriately eliminate specifications for aging management of active components thereby restoring the passive, long-lived criterion for components and commodities within the scope of this program. An exception had been taken to Item 2. in the OC LRA ; the number and magnitude of lifts by the crane are not tracked. Due to the GALL change, this exception is no longer required.	Yes. The exception to Item 2. regarding the number and magnitude of lifts by the crane is no longer applicable.
B.1.17	XI.M24	Compressed Air Monitoring	Added an emphasis on stainless steel components.	The Oyster Creek program precludes aging effects on all component materials.	No
B.1.18	XI.M25	BWR Reactor Water Cleanup System	1. Editorial changes. 2. Clarification of the GALL position on acceptable date of ASME Code used, relative to 10CFR50.55a has been provided.	1. Editorial changes do not affect the technical assessment performed for Oyster Creek for this program. 2. Although NUREG-1801 specifies the 2001 edition including the 2002 and 2003 Addenda of the ASME Section XI Code,	No

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
				Subsections IWB, IWC, and IWD for inspection, repair, and replacement, it allows an applicant to rely on a different version of the ASME Code providing it is justified. Oyster Creek's current ISI program plan for the fourth ten-year inspection interval, approved per 10 CFR 50.55a, is based on the 1995 edition 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.	
B.1.19	XI.M26	Fire Protection	1. Editorial changes 2. Added specification that visual inspections be performed by "fire protection qualified inspectors" 3. Deleted specifications for VT-1/VT-3 or equivalent inspections 4. Deleted GALL industry OE discussion that said no corrosion-related problems have been reported for the fuel supply line, pump casing of diesel fire pump, or halon CO2 systems, and no aging-related problems found with fire protection systems, emergency breathing and auxiliary equipment, and communication equipment.	1. Editorial changes do not affect the technical assessment performed for Oyster Creek for this program. 2. No significant effect – OC uses qualified personnel for these inspections 3. No significant effect. 4. No effect on LRA.	No
B.1.20	XI.M27	Fire Water System	1. Added specific reference to the edition of NFPA 25 used, as well as the specific sections. 2. Flow testing specifications are less prescriptive. 3. Monitoring and trending is now "as specified by the associated plant commitments pertaining to NFPA codes and standards".	1. Change is not technically significant. 2. Change is not technically significant. 3. Change is not technically significant.	No
N/A	XI.M28	Buried Piping and Tanks Surveillance	Program not used at Oyster Creek.	N/A	No
B.1.21	XI.M29	Aboveground Steel Tanks	Editorial changes.	Editorial changes do not affect the technical assessment performed for Oyster Creek for this program.	No
B.1.22	XI.M30	Fuel Oil	1. NUREG-1801 states in XI.M30 that the	1. Oyster Creek has not adopted the	Yes. This is a

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
		Chemistry	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. 2. A new standard is invoked for fuel oil, ASTM D6217, as an acceptable alternative to ASTM D2276 for particulate.	Standard Technical Specifications as described in these NUREG's, 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. These include testing requirements for new fuel oil (API gravity, kinematic viscosity, water and sediment) prior to adding the new fuel to the storage tank to ensure that the oil has not been contaminated with substances that would have an immediate detrimental impact on diesel engine combustion, and, testing of new fuel after adding it to the storage tank to confirm that the remaining fuel oil properties are within specification requirements. Oyster Creek fuel oil activities also provide for the trending of particulate contamination in new and stored fuel oil. Water and Sediment is drained periodically (quarterly) from the Emergency Diesel Generator Fuel Storage Tank. This periodicity exceeds the Standard Technical Specifications requirements of "once every [31] days", however, it is aligned with the requirements of Regulatory Guide 1.137 which states that a quarterly basis is sufficient unless accumulated condensation is suspected (in which case a monthly basis is appropriate). 2. Fuel oil will be routinely sampled and analyzed for particulate contamination in accordance with modified ASTM Standard D 2276-00, Method A. The alternative methods of ASTM D 6217 will not be used.	new exception (item 1).
B.1.23	XI.M31	Reactor Vessel Surveillance	1. Only untested capsules must be maintained for future use. 2. Deleted specification that changes to storage requirements must be approved by the NRC.	1. Change is not technically significant. 2. Change is not technically significant.	No
B.1.24	XI.M32	One-Time Inspection	1. Excludes Class 1 piping less than or equal to NPS 4 in favor of new M35 Program. 2. Deleted specification that inspection be	1. (a) NUREG-1801 states in XI.M32 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	Yes. These are new exceptions (item 1). See also document

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
			in strict accordance with App B, instead permitting "qualified" personnel to follow "procedures" consistent with it. 3. Now permits "equivalent" VT inspections. 4. Added a clear specification that inspections occur no earlier than 10 years before the PEO. 5. Deleted provision for remote visual inspections. 6. Included new guidelines for establishing sample sizes, such as materials of fabrication, environment, plausible aging effects, and operating experience.	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 or equal to NPS 4. (b) NUREG-1801 specifies (in XI.M1, XI.M32, and XI.M35) 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. (c) NUREG-1801 states in XI.M35, One Time Inspection of ASME Code Class 1 Small Bore-Piping, 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. (d) See also document "Reconciliation of Program and Line Item Differences Between January 2005 Draft NUREG-1801 and September 2005 NUREG-1801 Revision 1", Attachment 2.	"Reconciliation of Program and Line Item Differences Between January 2005 Draft NUREG-1801 and September 2005 NUREG-1801 Revision 1", Attachment 2.

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
				2. This is less restrictive than the previous specification for inspection quality. 3. One-Time inspections for Oyster Creek will consist of volumetric examinations. 4. Oyster Creek is already within 10 years of the PEO (2009). 5. Remote visual inspections are not planned for One-Time inspections. 6. The One-Time Inspection Sample Basis Document addresses the following: (a) determination of the sample size based on an assessment of materials of fabrication, environment, plausible aging effects, and operating experience; (b) identification of the inspection locations in the system or component based on the aging effect; (c) determination of the examination technique, including acceptance criteria that would be effective in managing the aging effect for which the component is examined; and (d) evaluation of the need for follow-up examinations to monitor the progression of aging if age-related degradation is found that could jeopardize an intended function before the end of the period of extended operation.	
B.1.25	XI.M33	Selective Leaching of Materials	1. Editorial changes. 2. Added visual inspections to discussion of inspection techniques.	1. Editorial changes do not affect the technical assessment performed for Oyster Creek for this program. 2. No technical effect. Visual examinations were already included in other program elements.	No
B.1.26	XI.M34	Buried Piping and Tanks Inspection	1. Added that gray cast iron should be managed under Chapter XI.M33, "Selective Leaching of Materials." 2. New specification that opportunistic inspections be performed in highly susceptible areas or those with a history of corrosion. 3. Verification will now be required that at least one focused or opportunistic inspection in historically or suspected to be susceptible areas was performed prior to the PEO but within the past 10 years.	(1-3) No technical effect. These differences are already addressed in the LRA.	No
N/A	XI.M35	One-time	New Program, not applicable to OC.	See One-Time Inspection program B.1.24	Yes. See One-

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
		Inspection of ASME Code Class 1 Small Bore-Piping	[Specifications incorporated into One-Time Inspection.]	(XI.M32).	Time Inspection program B.1.24 (XI.M32).
N/A	XI.M36	External Surfaces Monitoring	New Program. Program not used at Oyster Creek. [Specifications incorporated into Structures Monitoring Program]	See Structures Monitoring Program B.1.31 (XI.S6).	Yes. See Structures Monitoring Program B.1.31 (XI.S6).
N/A	XI.M37	Flux Thimble Tube Inspection	New Program. Program not used at Oyster Creek.	N/A	No
N/A	XI.M38	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components	New Program. Program not used at Oyster Creek. [Specifications incorporated into Periodic Inspection of Ventilation Systems]	See Periodic Inspection of Ventilation Systems B.2.4.	Yes. See Periodic Inspection of Ventilation Systems B.2.4.
N/A	XI.M39	Lubricating Oil Analysis	New Program. Program not used at Oyster Creek. [Specifications incorporated into Lubricating Oil Monitoring Activities program.]	See Lubricating Oil Monitoring Activities program B.2.2.	Yes. See Lubricating Oil Monitoring Activities program B.2.2.
B.1.27	XI.S1	ASME Section XI, Subsection IWE	No changes.	N/A	No
N/A	XI.S2	ASME Section XI, Subsection IWL	Program not used at Oyster Creek.	N/A	No
B.1.28	XI.S3	ASME Section XI, Subsection IWF	No changes.	N/A	No
B.1.29	XI.S4	10 CFR 50 Part 50, Appendix J	No changes.	N/A	No
B.1.30	XI.S5	Masonry Wall Program	No changes.	N/A	No
B.1.31	XI.S6	Structures Monitoring Program	There are no changes for structures. However, Oyster Creek credits the Structures Monitoring Program for managing aging effects of external surfaces of mechanical components, which are covered by new GALL Program XI.M36, External Surfaces. 1. Monitoring of external surfaces of mechanical components under the Oyster Creek Structures Monitoring	1. Oyster Creek takes exception to the frequency of every refueling cycle specified in XI.M36. Technical basis for the exception is, a) 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-	Yes

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
			Program is every 4 years; whereas XI.M36 is every refueling cycle. 2. XI.M36 also specifies monitoring for leakage and the Structures Monitoring does not.	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 elastomer 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. b) 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. c) Mechanical components subject to outdoor air are constructed from stainless steel, aluminum, which are not susceptible to accelerated corrosion, or carbon steel components protected by protective coatings such as galvanizing, 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. d) Studies by EPRI (Reference: TR-103840, fig. 4.1-1) provides 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 ½ 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	

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
				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. 2. The program will be enhanced to require visual inspection of external surfaces of mechanical steel components that are not covered by other programs for leakage from or onto external surfaces, worn, flaking, or oxide-coated surfaces, corrosion stains on thermal insulation, and protective coating degradation (cracking and flaking). See also document "Reconciliation of Program and Line Item Differences Between January 2005 Draft NUREG-1801 and September 2005 NUREG-1801 Revision 1", Attachment 2.	
B.1.32	XI.S7	RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants	No changes.	N/A	No
B.1.33	XI.S8	Protective Coating Monitoring and Maintenance Program	1. Editorial changes. 2. Added "or during the general visual inspection" to element 4 to allow the thorough inspections to be done during the general visual inspection as opposed to afterwards. 3. ASTM D 5163-05 has replaced GALL References to ASTM D 5163-96.	1. Editorial changes do not affect the technical assessment performed for Oyster Creek for this program. 2. Minor clarification. It really makes no difference whether the thorough inspections are done during the general inspection or as a different activity after the general inspections. 3. No impact since the Oyster Creek response to GL 98-04 is the program that is used to satisfy the requirement for "an acceptable coatings maintenance aging management program (AMP) for license renewal" as identified in the "Program Description" paragraph of NUREG-1801 Chapter XI program XI.S8, Protective Coating Monitoring and Maintenance Program. The Oyster Creek commitments	No

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
				from the GL 98-04 response do not include ASTM D 5163 so this change is not relevant.	
B.1.34	XI.E1	Electrical Cables and Connections not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Editorial changes.	Editorial changes do not affect the technical assessment performed for Oyster Creek for this program.	No
B.1.35	XI.E2	Electrical Cables and Connections not Subject to 10 CFR 50.49 Environmental Qualification Requirements used in Instrumentation Circuits	Editorial changes.	Editorial changes do not affect the technical assessment performed for Oyster Creek for this program.	No
B.1.36	XI.E3	Inaccessible Medium-Voltage Cables not Subject to 10 CFR 50.49 Environmental Qualification Requirements	1. Editorial changes. 2. The previous versions of GALL did not define medium voltage. The September 2005 revision to GALL defines medium voltage as 2kV – 35kV. OC's 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.	1. Editorial changes do not affect the technical assessment performed for Oyster Creek for this program. 2. 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.	Yes Revision required to reflect the inclusion of 34.5 kV cables.
N/A	XI.E4	Metal Enclosed Bus	Program not used at Oyster Creek.	N/A	No
N/A	XI.E5	Fuse Holders	Program not used at Oyster Creek.	N/A	No
N/A	XI.E6	Electrical Cable Connections not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Program not used at Oyster Creek.	N/A	No
B.2.2	N/A	Lubricating Oil Monitoring Activities	Plant specific program that incorporates the specifications of GALL program XI.M39 Lubricating Oil Analysis.	See document "Reconciliation of Program and Line Item Differences Between January 2005 Draft NUREG-1801 and September 2005	Yes. See document "Reconciliation of

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
				NUREG-1801 Revision 1", Attachment 2.	Program and Line Item Differences Between January 2005 Draft NUREG-1801 and September 2005 NUREG-1801 Revision 1", Attachment 2.
B.2.4	N/A	Periodic Inspection of Ventilation Systems	Plant specific program that incorporates the specifications of GALL program XI.M38 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components.	See document "Reconciliation of Program and Line Item Differences Between January 2005 Draft NUREG-1801 and September 2005 NUREG-1801 Revision 1", Attachment 2.	No. See document "Reconciliation of Program and Line Item Differences Between January 2005 Draft NUREG-1801 and September 2005 NUREG-1801 Revision 1", Attachment 2.
B.3.1	X.M1	Metal Fatigue of Reactor Coolant Pressure Boundary	The specification that the minimum list of high fatigue usage locations include those locations in NUREG/CR-6260 and any additional critical components in the plant was revised. GALL now specifies high fatigue usage locations to include the locations identified in NUREG/CR-6260, as a minimum, or proposed alternatives based on plant configuration.	The change allows the use of alternative locations in lieu of those specified in NUREG/CR-6260. To address the effects of the coolant environment on component fatigue life at Oyster Creek, plant-specific calculations have been performed for the locations identified in NUREG/CR-6260 for older-vintage GE BWR plants. The six locations are: 1. Reactor Vessel (Lower Head to Shell Transition) 2. Feedwater Nozzle 3. Recirculation System (SDC Return Line Tee), including the RPV recirculation inlet and outlet nozzles 4. Core Spray System (Nozzle and Safe End) 5. Isolation Condenser Return to Shutdown Cooling 6. Limiting Feedwater Line Location These locations are the same as those identified in NUREG/CR-6260, except that the Isolation Condenser Return to Shutdown Cooling was analyzed instead of the RCIC return to the feedwater system, since Oyster	No

OC Program No.	GALL AMP	AMP	Identification of Applicable Differences	Technical Assessment of Significance	LRA Impacted
				Creek does not have a RCIC system. The resultant fatigue usage factors from these environmental fatigue analyzes are less than acceptance limits for the period of extended operation; therefore, it was not necessary to analyze additional locations in the RCPB.	
N/A	X.S1	Concrete Containment Tendon Prestress	Program not used at Oyster Creek.	N/A	No
B.3.2	X.E1	Environmental Qualification (EQ) of Electrical Components	No changes.	N/A	No

Attachment 2

New Aging Management Programs in September 2005 Revision 1 GALL Vs. Corresponding Programs Used in the Oyster Creek LRA

Attachment 2.1	OC LRA Use of B.1.24 XI.M32 One-Time Inspection program vs. XI.M35 One-Time Inspection of ASME Code Class 1 Small-Bore Piping program
Attachment 2.2	OC LRA Use of B.1.31 XI.S6 Structures Monitoring Program vs. XI.M36 External Surfaces Monitoring program
Attachment 2.3	OC LRA Use of B.2.04 Periodic Inspection of Ventilation Systems program vs. XI.M38 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program
Attachment 2.4	OC LRA Use of B.2.2 Lubricating Oil Monitoring Activities program vs. XI.M39 Lubricating Oil Analysis program

OC LRA Use of B.1.24 XI.M32 ONE-TIME INSPECTION Program vs. XI.M35 ONE-TIME INSPECTION OF ASME CODE CLASS 1 SMALL-BORE PIPING PROGRAM

Program Description:
The NUREG-1801, Revision 1 aging management program XI.M35, *One-Time Inspection of ASME Code Class 1 Small Bore-Piping* will not be used at Oyster Creek. The Oyster Creek XI.M32 One-Time Inspection aging management program B.1.24 will use volumetric examinations to provide additional assurance that aging that has not yet manifested itself is not occurring, or that the evidence of aging shows that the aging is so insignificant that an aging management program is not warranted for Class 1 piping less than NPS 4 (which does not receive volumetric examination during inservice inspection).

Summary of Exceptions to NUREG-1801:

The Oyster Creek One-Time Inspection aging management program B.1.24 will include the one-time inspection of Class 1 piping less than NPS 4.

NUREG-1801 references in XI.M35 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.

NUREG-1801 states in XI.M35, One Time Inspection of ASME Code Class 1 Small Bore-Piping, 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.

1. Scope of Program:
The Oyster Creek One-Time Inspection aging management program will confirm that cracking initiation and growth due to stress corrosion cracking (SCC), intergranular stress corrosion cracking (IGSCC), or thermal and mechanical loading is not occurring in Class 1 piping less than four-inch NPS, and includes measures to verify that unacceptable degradation is not occurring, thereby validating the effectiveness of existing aging management programs or confirming that there is no need to manage aging-related degradation for the period of extended operation.

Systems in the scope of the One-Time Inspection program for ASME Code Class 1 Small-Bore Piping Include:

Class 1 Piping Less than 4 inch in diameter NPS	• Control Rod Drive System • Core Spray System • Feedwater System • Isolation Condenser System • Main Steam System • Nuclear Boiler Instrumentation • Post-Accident Sampling System • Reactor Head Cooling System • Reactor Recirculation System • Reactor Water Cleanup System • Shutdown Cooling System • Standby Liquid Control System (Liquid Poison System)	Crack Initiation and Growth

Result: This element of the Oyster Creek XI.M32 One-Time Inspection aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M35 One-Time Inspection of ASME Code Class 1 Small-Bore Piping, with the exceptions identified above.

2. Preventive Actions:
The Oyster Creek One-Time Inspection aging management program is an inspection program to provide assurance that aging that has not yet manifested itself is not occurring, or that the evidence of aging shows that the aging is so insignificant that an aging management program is not warranted for Class 1 piping less than NPS 4.

Result: This element of the Oyster Creek XI.M32 One-Time Inspection aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M35 One-Time Inspection of ASME Code Class 1 Small-Bore Piping, with the exceptions identified above.

3. Parameters Monitored/Inspected:
To confirm crack initiation and growth is not occurring in Class 1 piping with a diameter less than NPS 4, the One-Time Inspection program will utilize volumetric examination to inspect areas susceptible to stress corrosion cracking, intergranular stress corrosion cracking, or thermal and mechanical loading.

Result: This element of the Oyster Creek XI.M32 One-Time Inspection aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M35 One-Time Inspection of ASME Code Class 1 Small-Bore Piping, with the exceptions identified above.

4. Detection of Aging Effects:
To confirm crack initiation and growth is not occurring in Class 1 piping with a diameter less than NPS 4, the One-Time Inspection program will inspect areas susceptible to stress corrosion cracking, intergranular stress corrosion cracking, or thermal and mechanical loading.

Result: This element of the Oyster Creek XI.M32 One-Time Inspection aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M35 One-Time Inspection of ASME Code Class 1 Small-Bore Piping, with the exceptions identified above.

5. Monitoring and Trending:
The One-Time Inspection aging management program provides for the evaluation of the need for follow-up examinations and increased inspection sample size to monitor the progression of aging if age-related degradation is found that could jeopardize an intended function before the end of the period of extended operation. The determination of the sample size of ASME Code Class 1 small-bore piping will be based on susceptibility, inspectability, dose considerations, and operating experience. Should aging effects be detected, the corrective action program triggers actions to characterize the nature and extent of the aging effect and determines what subsequent monitoring is needed to ensure intended functions are maintained during the period of extended operation.

Result: This element of the Oyster Creek XI.M32 One-Time Inspection aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M35 One-Time Inspection of ASME Code Class 1 Small-Bore Piping, with the exceptions identified above.

6. Acceptance Criteria:
For Class 1 piping, the Oyster Creek program directs evaluation of examination results in accordance with the 1995 ASME Section XI Code, 1996 addenda. Examination results are evaluated in accordance with IWB-3131 by comparing the results with the acceptance standards of IWB-3400. Additional examinations are performed in accordance with IWB-2430.

Result: This element of the Oyster Creek XI.M32 One-Time Inspection aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M35 One-Time Inspection of ASME Code Class 1 Small-Bore Piping, with the exceptions identified above.

7. Corrective Actions:
Evaluations will be performed for inspection results that do not satisfy established criteria and a Issue Report (IR) will be initiated to document the concern in accordance with the Oyster Creek 10 CFR Part 50, Appendix B corrective action program. The 10 CFR Part 50, Appendix B corrective action program ensures that the conditions adverse to quality are promptly corrected. If the deficiency is assessed to be significantly adverse to quality, the cause of the condition is determined and an action plan is developed to preclude repetition.

Result: This element of the Oyster Creek XI.M32 One-Time Inspection aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M35 One-Time Inspection of ASME Code Class 1 Small-Bore Piping.

8. Confirmation Process:
See Item 7 above.

Result: This element of the Oyster Creek XI.M32 One-Time Inspection aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M35 One-Time Inspection of ASME Code Class 1 Small-Bore Piping.

9. Administrative Controls:
See item 7 above.

Result: This element of the Oyster Creek XI.M32 One-Time Inspection aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M35 One-Time Inspection of ASME Code Class 1 Small-Bore Piping.

10. Operating Experience:
For objective evidence of the effectiveness of the ASME Section XI program (e.g., scope of the inspections and inspection techniques), see Program Basis Document PBD-AMP-B.1.01, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD."

Result: This element of the Oyster Creek XI.M32 One-Time Inspection aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M35 One-Time Inspection of ASME Code Class 1 Small-Bore Piping.

OC LRA Use of B.1.31 XI.S6 STRUCTURES MONITORING Program vs. XI.M36 EXTERNAL SURFACES MONITORING Program

Program Description:
The NUREG-1801, Revision 1 aging management program XI.M36, External Surfaces Monitoring will not be used at Oyster Creek. The Oyster Creek XI.S6 Structures Monitoring aging management program B.1.31 will be enhanced to include the specifications of NUREG-1801 Rev. 1 XI.M36, Exterior Surfaces Monitoring. The specifications of this new AMP apply to exterior surfaces of mechanical components of Oyster Creek, Forked River Combustion Turbine (FRCT), and the radio communications system located at the meteorological tower site that have been determined to be in scope of license renewal and are not covered by other programs.

Exception to NUREG-1801:
The program takes exception to the frequency specified in NUREG–1801 Rev. 1 XI.M36, External Surfaces Monitoring, for monitoring external surfaces of Oyster Creek and FRCT mechanical components. The frequency specified by Oyster Creek Structures Monitoring Program is every 4 years; whereas the frequency specified in XI.M36 is at least once per refueling cycle. Technical basis for this exception is that, based on plant specific operating experience and industry experience, the 4-year frequency is adequate to provide reasonable assurance that aging effects will be detected and corrected before a loss of an intended function. See the discussion of this technical basis in Section 4, Detection of Aging Effects.

The Oyster Creek Structures Monitoring Program implementing procedure will be enhanced to incorporate the specifications of the NUREG-1801 Rev. 1 XI.M36, Exterior Surfaces Monitoring program as follows:

The program will be enhanced to require visual inspection of external surfaces of mechanical steel components that are not covered by other programs for leakage from or onto external surfaces; worn, flaking, or oxide-coated surfaces; corrosion stains on thermal insulation, and protective coating degradation (cracking and flaking). These enhanced requirements are applicable to mechanical components of Oyster Creek, Forked River Combustion Turbine (FRCT), and the radio communications system located at the meteorological tower site.

1. Scope of Program:
In order to include the specifications of the XI.M36 External Surfaces Monitoring program, the scope of the OC Structures Monitoring Program will be enhanced to include inspection of exterior surfaces of mechanical components of Oyster Creek, Forked River Combustion Turbine (FRCT), and the radio communications system located at the meteorological tower site that are not covered by other programs, including exterior surfaces of HVAC ducts, damper housings and duct closure bolting within the scope of license renewal. Components that will be added to scope of the program include piping components, valves, tanks, vessels, etc. located in indoor or outdoor air environments. The scope of the

program is limited to components whose exterior surfaces are not monitored by other programs such as ASME Section XI, ISI Programs and fire protection activities.

Result: This element of the Oyster Creek XI.S6 Structures Monitoring Program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M36 External Surfaces Monitoring, with the exception and enhancement identified above.

2. Preventive Actions:

The program specifies no preventive actions. The program is a condition monitoring program that utilizes inspections to identify aging effects prior to loss of intended function.

Result: This element of the Oyster Creek XI.S6 Structures Monitoring Program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M36 External Surfaces Monitoring, with the exception and enhancement identified above.

3. Parameters Monitored/Inspected:

The enhanced Oyster Creek Structures Monitoring Program contains sufficient detail on parameters monitored or inspected to conclude with reasonable assurance that the XI.M36 External Surfaces Monitoring Program attributes are satisfied. The program will be enhanced to require visual inspection of external surfaces of mechanical 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). These enhanced requirements are applicable to mechanical components of Oyster Creek, Forked River Combustion Turbine (FRCT), and the radio communications system located at the meteorological tower site.

Result: This element of the Oyster Creek XI.S6 Structures Monitoring Program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M36 External Surfaces Monitoring, with the exception and enhancement identified above.

4. Detection of Aging Effects:

The OC Structures Monitoring Program requires monitoring of each structure/aging effects by qualified individuals every 4 years to ensure age related degradations would be detected and quantified before there is a loss of intended function.

Result: This element of the Oyster Creek XI.S6 Structures Monitoring Program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M36 External Surfaces Monitoring, with the exception and enhancement identified above.

Inspection methods, inspection schedule, and inspector qualification are consistent with industry guidelines and NRC guidance for implementing the requirements of 10 CFR 50.65, the Maintenance Rule. Inspection methods consist of visual inspections conducted on a frequency of every 4 years in accessible areas of the plant. The program contains provisions for more frequent inspections to ensure that observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process. Inaccessible areas, such as buried structures are inspected when they become uncovered. External surfaces of Oyster Creek and FRCT mechanical components, including HVAC ducts, damper housings, and bolting will be inspected on a frequency of every 4 years consistent with inspection frequency for structures. This constitutes an exception to NUREG-1801 Rev. 1 AMP XI.M36, External Surfaces Monitoring, which specifies these inspections be performed at least once per refueling outage. 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 elastomer 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 (see section 10 below).

- 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 galvanizing 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 ½ 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.

Result: This element of the Oyster Creek XI.S6 Structures Monitoring Program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M36 External Surfaces Monitoring, with the exception and enhancement identified above.

5. Monitoring and Trending:

Inspection methods, inspection schedule, and inspector qualification are consistent with industry guidelines and NRC guidance for implementing the requirements of 10 CFR 50.65, the Maintenance Rule. Inspection methods consist of visual inspections conducted on a frequency of every 4 years in accessible areas of the plant. The program contains provisions for increased inspection frequency and trending of structures and components, consistent with 10CFR50.65 (a)(1), if the degradation is such that the structure or component may not meet its design basis, or, if allowed to continue uncorrected until the next normally scheduled assessment, may not meet its design basis.

Result: This element of the Oyster Creek XI.S6 Structures Monitoring Program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M36 External Surfaces Monitoring, with the exception and enhancement identified above.

6. Acceptance Criteria:

The enhanced Oyster Creek Structures Monitoring Program requires that identified degradations be assessed and evaluated by qualified engineering personnel, considering the extent of the degradation using design basis codes and standards that include ASME/ANSI. The program implementing procedure provides sufficient details on acceptance criteria for structures and exterior surfaces of mechanical components to ensure that significant degradations are identified and corrected before a loss of an intended function.

Result: This element of the Oyster Creek XI.S6 Structures Monitoring Program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M36 External Surfaces Monitoring, with the exception and enhancement identified above.

7. Corrective Actions:

Evaluations are performed for inspection results that do not satisfy established criteria and an Issue Report (IR) is initiated to document the concern in accordance with 10 CFR 50, Appendix B, Corrective Action Program. The corrective action process ensures that the conditions adverse to quality are promptly corrected. If the deficiency is assessed to be significantly adverse to quality, the cause of the condition is determined and an action plan is developed to preclude repetition.

Result: This element of the Oyster Creek XI.S6 Structures Monitoring Program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M36 External Surfaces Monitoring.

8. Confirmation Process:
See Item 7, above.

Result: This element of the Oyster Creek XI.S6 Structures Monitoring Program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M36 External Surfaces Monitoring.

9. Administrative Controls:
See Item 7, above.

Result: This element of the Oyster Creek XI.S6 Structures Monitoring Program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M36 External Surfaces Monitoring.

10. Operating Experience:
Searches of Oyster Creek corrective action process (CAP) database identified 217 instances of corrosion cases on exterior surfaces of mechanical components and structures. For 216 cases, engineering evaluation concluded that the observed corrosion is limited to surface rust and does not impact the intended function of the component or structure. For the remaining one case, a unistrut support member for 3/8 " diameter tubing, corrosion was more extensive but the unistrut was evaluated and determined capable of performing its intended function. These examples provide objective evidence that deficiencies are entered into the corrective action process and that engineering evaluations are performed to determine what if any corrective actions need to be taken prior to loss of intended function.

The operating experience of the Oyster Creek Structures Monitoring Program did not show any adverse trend in performance. Problems identified would not cause significant impact to the safe operation of the plant, and adequate corrective actions were taken to prevent recurrence. There is sufficient confidence that the implementation of the Structures Monitoring Program as described in the implementing procedures will effectively manage aging effects through the period of extended operation.

Result: This element of the Oyster Creek XI.S6 Structures Monitoring Program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M36 External Surfaces Monitoring.

OC LRA Use of B.2.04 PERIODIC INSPECTION OF VENTILATION SYSTEMS Program vs. XI.M38 INSPECTION OF INTERNAL SURFACES IN MISCELLANEOUS PIPING AND DUCTING COMPONENTS Program

Program Description:
The NUREG-1801, Revision 1 aging management program XI.M38, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components will not be used at the Oyster Creek station, but is used for the Forked River Combustion Turbine site, see note below. The Oyster Creek Periodic Inspection of Ventilation Systems aging management program B.2.04, enhanced to include specific guidance for inspection for loss of material by corrosion, rust, pitting or wear, and for change in material properties by inspecting for cracking, perforations or other damage, will be used to satisfy the specifications of the NUREG-1801 Rev. 1 XI.M38 program. The specifications of this new AMP apply to internal (and external) surfaces of the Oyster Creek Generating Station piping and ducting components that have been determined to be in scope of license renewal and that are not covered by other programs.

> Note: The portion of the Oyster Creek License Renewal Application applicable to the Forked River Combustion Turbine (FRCT) was developed in accordance with the September 2005 Revision 1 NUREG-1801 XI.M38 program, and this reconciliation does not apply to that portion of the LRA.

The Oyster Creek Periodic Inspection of Ventilation Systems aging management program preventive maintenance procedures is enhanced to provide specific guidance to inspect for the following aging effects:

- Loss of Material by inspecting for corrosion, rust, pitting or wear, and;
- 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 to the September 2005 Revision 1 NUREG-1801.

An exception due to reconciliation with September 2005 Revision 1 NUREG-1801 is inspection of coatings – the Oyster Creek Periodic Inspection of Ventilation Systems aging management program B.2.04 does not take credit for coatings for internal surfaces, but directly inspects for loss of material.

1. Scope of Program:
September 2005 Revision 1 NUREG-1801 program XI.M38, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components, addresses visual inspections to include internal surfaces of steel piping, piping elements, ducting, and components in an internal environment (such as indoor uncontrolled air, condensation, and steam) that are not included in other aging management programs for loss of material. The Inspections are to be performed when the internal surfaces are accessible during the performance of periodic surveillances, during maintenance activities or during scheduled outages. These specifications are satisfied by the OC Periodic Inspection of Ventilation Systems aging

management program, which manages the aging effects of loss of material, reduction of heat transfer, and change in material properties through visual inspections of ventilation systems in the scope of license renewal. The scope of existing inspections includes flexible connections, fan and filter housings, and access door seals. The program is enhanced to include ducts exposed to soil, instrument piping and valves, restricting orifices and flow elements, and thermowells. Inspections of carbon steel fan and filter housings are considered representative of the internal surfaces of the carbon steel damper housings in the system. If aging degradation is identified on the fan or filter housing internal carbon steel surfaces, the condition will be evaluated to determine if the carbon steel damper housings will require internal inspection.

Result: This element of the enhanced Oyster Creek B.2.4 Periodic Inspection of Ventilation Systems aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M38 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components.

2. Preventive Actions:

The OC Periodic Inspection of Ventilation Systems aging management program specifies no preventive actions. The program is a condition monitoring program that utilizes visual inspections to identify aging effects prior to loss of intended function.

Result: This element of the enhanced Oyster Creek B.2.4 Periodic Inspection of Ventilation Systems aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M38 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components.

3. Parameters Monitored/Inspected:

September 2005 Revision 1 NUREG-1801 program XI.M38, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components, addresses visual inspections of internal surfaces of plant components to be performed during maintenance or surveillance activities. Parameters monitored or inspected include visible evidence of corrosion to indicate possible loss of materials. These specifications are satisfied by the OC Periodic Inspection of Ventilation Systems aging management program, which provides for visual inspections of the ventilation system ductwork and components to determine if penetrating corrosion indicating a loss of material aging degradation is occurring. Heat transfer surfaces are also inspected for fouling. Flexible connections are inspected to ensure they are free of cracking, damage and loss of material. Door seals are inspected for cracking or damage when the associated access door is opened, or are inspected for leakage when the door in closed and the system is in service. The flexible connections and door seals are evaluated if cracking, damage or leakage is identified. For the Standby Gas Treatment, Reactor Building Ventilation and Control Room Ventilation Systems, the results of the

inspections are verified by the performance of system leakage tests and filter efficiency tests.

These inspections and tests manage the aging effects that could impact system and component pressure boundary integrity, providing reasonable assurance that ventilation system intended functions will be maintained consistent with the current licensing basis, for the period of extended operation

Result: This element of the enhanced Oyster Creek B.2.4 Periodic Inspection of Ventilation Systems aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M38 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components.

4. Detection of Aging Effects:
September 2005 Revision 1 NUREG-1801 program XI.M38, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components, addresses periodic inspections to provide for detection of aging effects prior to the loss of component function. For painted or coated surfaces, degradation of steel surfaces cannot occur without the degradation of the paint or coating. Confirmation of the integrity of the paint or coating is an effective method for managing the effects of corrosion on the steel surface. Inspection intervals are established such that they provide timely detection of degradation. The OC Periodic Inspection of Ventilation Systems aging management program satisfies these specifications as follows:

Ventilation system components are subject to the following aging effects:
- Loss of Material
- Change in Material Properties (Elastomer materials)
- Reduction of Heat Transfer

The preventive maintenance procedures will be enhanced to provide the following specific guidance to inspect for aging effects:
- Loss of Material: Inspect for corrosion, rust, pitting or wear
- Change in Material Properties: Inspect for cracking, perforations or other damage

Aging effects are detected by periodic visual inspections and system tests. These inspections and tests are performed on a frequency not to exceed five years, to detect aging prior to loss of system function. The visual inspections are performed by qualified and experienced maintenance personnel.

An exception due to reconciliation with September 2005 Revision 1 NUREG-1801 is inspection of coatings – the Oyster Creek Periodic Inspection of Ventilation Systems aging management program B.2.04 does not take credit for coatings for internal surfaces, but directly inspects for loss of material.

Result: This element of the enhanced Oyster Creek B.2.4 Periodic Inspection of Ventilation Systems aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M38 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components. An exception associated with reconciliation to the September 2005 Revision 1 NUREG-1801 document concerns inspection of coatings; the Oyster Creek Periodic Inspection of Ventilation Systems aging management program B.2.04 does not take credit for coatings for internal surfaces, but directly inspects for loss of material.

5. Monitoring and Trending:

September 2005 Revision 1 NUREG-1801 program XI.M38, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components directs that visual inspection activities are performed and associated personnel are qualified in accordance with site controlled procedures and processes. Maintenance and surveillance activities provide for monitoring and trending of aging degradation. Inspection intervals are dependent on component material and environment, and take into consideration industry and plant-specific operating experience. Results of the periodic inspections are monitored for indications of various corrosion mechanisms and fouling. The extent and schedule of inspections and testing assure detection of component degradation prior to loss of intended functions. The OC Periodic Inspection of Ventilation Systems aging management program satisfies these specifications by addressing periodic visual examinations which are used to provide assurance that penetrating corrosion of ventilation system duct and components are not occurring or are occurring at an acceptable rate. The condition of the elastomers used in ventilation systems are monitored and the results of the inspections are reviewed to assure intended functions are maintained. Flexible connections and access door seals are repaired or replaced if damage or deterioration is detected

Result: This element of the enhanced Oyster Creek B.2.4 Periodic Inspection of Ventilation Systems aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M38 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components.

6. Acceptance Criteria:

September 2005 Revision 1 NUREG-1801 program XI.M38, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components directs that indications of various corrosion mechanisms or fouling that would impact component intended function are reported and require further evaluation. The acceptance criteria are to be established in the maintenance and surveillance procedures or other established plant procedures. If the results are not acceptable, the corrective action program is implemented to assess the material condition and determine whether the component intended function is affected. The OC Periodic Inspection of Ventilation Systems aging management program satisfies these specifications by inspecting ventilation duct and components for signs of loss of material. Elastomers are inspected for cracking, damage and

loss of material. Elastomers are repaired or replaced if a degraded condition is found. Heat transfer surfaces are inspected for corrosion and fouling. Identified aging effects are evaluated by engineering to determine a) if penetrating corrosion indicating a loss of material aging is occurring, and if so, b) the rate at which the material is being lost. Engineering evaluations will also c) determine the need for follow-up examinations to monitor the progression of aging degradation, and d) identify appropriate corrective actions to mitigate any excessive rates of degradation discovered.

Result: This element of the enhanced Oyster Creek B.2.4 Periodic Inspection of Ventilation Systems aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M38 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components.

7. Corrective Actions:

September 2005 Revision 1 NUREG-1801 program XI.M38, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components specifies that the site corrective actions program, quality assurance (QA) procedures, site review and approval process, and administrative controls are implemented in accordance with the requirements of 10 CFR Part 50, Appendix B. As discussed in the appendix to this report, the staff finds the requirements of 10 CFR Part 50, Appendix B, acceptable to address the corrective actions, confirmation process, and administrative controls. The OC Periodic Inspection of Ventilation Systems aging management program satisfies these specifications by requiring that evaluations are performed for inspection results that identify penetrating corrosion or elastomer degradation, or test results that do not satisfy established criteria, and an issue report is initiated to document the concern in accordance with plant administrative procedures and the requirements of 10 CFR Part 50, Appendix B. The corrective actions program ensures that the conditions adverse to quality are promptly corrected. If the deficiency is assessed to be significantly adverse to quality, the cause of the condition is determined and an action plan is developed to preclude recurrence.

Result: This element of the enhanced Oyster Creek B.2.4 Periodic Inspection of Ventilation Systems aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M38 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components.

8. Confirmation Process:

See Item 7, above.

Result: This element of the enhanced Oyster Creek B.2.4 Periodic Inspection of Ventilation Systems aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M38 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components.

9. Administrative Controls:
See Item 7, above.

Result: This element of the enhanced Oyster Creek B.2.4 Periodic Inspection of Ventilation Systems aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M38 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components.

10. Operating Experience:
September 2005 Revision 1 NUREG-1801 program XI.M38, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components states that inspection of internal surfaces during the performance of periodic surveillances and maintenance activities have been in effect at many utilities in support of plant components reliability programs. These activities have proven effective in maintaining the material condition of plant systems, structures, and components. The applicant is to evaluate recent operating experience and provide objective evidence to support the conclusion that the effects of aging are adequately managed.

The OC Periodic Inspection of Ventilation Systems aging management program satisfies these specifications by demonstrating that the effects of aging are effectively managed is achieved through presentation of objective evidence that shows that loss of material, change in material properties and reduction of heat transfer is being adequately managed in Ventilation Systems. The following examples of operating experience provide objective evidence that the OC Periodic Inspection of Ventilation Systems program is effective in assuring that intended function(s) will be maintained consistent with the CLB for the period of extended operation:

1. Oyster Creek has experienced surface corrosion of outdoor equipment housings and duct, and damage to elastomers and deterioration of flexible connections that resulted in leakage of ventilation systems. These conditions were identified and corrected prior to loss of function of the systems. Maintenance procedures were revised to include steps to inspect for corrosion of outdoor equipment housings. Periodic preventive maintenance inspections of ventilation system components, including specific guidance to identify applicable aging effects, will effectively monitor the condition of system components such that degradation will continue to be identified prior to loss of intended functions. (fan housing - CAPs O2001-0162, O1998-0737; elastomers – CAP O2003-1281)

2. A buried section of Standby Gas Treatment system duct failed due to external corrosion of the aluminum duct exposed to a soil environment. The failure occurred after approximately thirty years in service. The failed section was repaired with a sleeve. Periodic inspections of the buried duct section will be performed. (SE-000822-023, CAP O2005-2288)

The operating experience of the Periodic Inspection of Ventilation Systems program did not show any adverse trend in performance. Problems identified would not cause significant impact to the safe operation of the plant, and adequate corrective actions were taken to prevent recurrence. There is sufficient confidence that the implementation of the Periodic Inspection of Ventilation Systems program will effectively determine loss of material, change in material properties, and reduction of heat transfer, with appropriate guidance for reevaluation, repair or replacement provided for locations where the aging effects occur. Periodic self-assessments of the Periodic Inspection of Ventilation Systems program are performed to identify the areas that need improvement to maintain the quality performance of the program.

Result: This element of the enhanced Oyster Creek B.2.4 Periodic Inspection of Ventilation Systems aging management program is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M38 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components.

OC LRA Use of B.2.2 LUBRICATING OIL MONITORING ACTIVITIES Program vs. XI.M39 LUBRICATING OIL ANALYSIS PROGRAM

Program Description:
The NUREG-1801, Revision 1 aging management program XI.M39, Lubricating Oil Analysis Program, will not be used at Oyster Creek. The Oyster Creek Lubricating Oil Monitoring Activities aging management program B.2.2 manages loss of material, cracking, and fouling in lubricating oil coolers, systems and components in the scope of license renewal. These activities include measures to minimize corrosion and to mitigate loss of material and cracking in lubricating oil heat exchangers by monitoring lubricating oil properties. Specifications of the XI.M39, Lubricating Oil Analysis Program are included through sampling, testing, and trending verify lubricating oil properties and ensure that the intended functions of the coolers are not lost. Oil analysis permits identification of specific wear mechanisms, contamination, and oil degradation within operating machinery and components. The activities manage physical and chemical properties in lubricating oil. The OC Lubricating Monitoring Activities aging management program performs sampling and analysis of lubricating oil for the presence of water, as well as particulates and contaminants for the purpose of detecting the presence of inleakage and corrosion product buildup. This program is augmented by the One-Time Inspection aging management program, B.1.24, to verify the effectiveness of the Lubricating Oil Monitoring Activities Program, B.2.2.

New exception to NUREG-1801, required due to incorporation of specifications from September 2005 Revision 1 GALL program XI.M39:
Parameters Monitored/Inspected (Element 3) specifies the flash point be measured for the lubricating oils. Flash Point is not measured for all lubricating oils in service, since this 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.

New enhancement to incorporate specification from XI.M39, Lubricating Oil Analysis Program:
The Oyster Creek Lubricating Oil Monitoring Activities aging management program B.2.2 will be enhanced to include sampling for and measurement of Flash Point for diesel engine lubricating oil.

1. Scope of Program:
The Oyster Creek Lubricating Oil Monitoring Activities Program samples lubricating oil from plant components subject to aging management review on a periodic basis.

Result: This element of the Oyster Creek aging management program Lubricating Oil Monitoring Activities is consistent with recommendations of the

NUREG-1801 Revision 1 aging management program, XI.M39 Lubricating Oil Analysis, with the exception and enhancement identified above.

2. Preventive Actions:
The Oyster Creek Lubricating Oil Monitoring Activities Program maintains oil systems contaminants (primarily water and particulates) within acceptable limits.

Result: This element of the Oyster Creek aging management program Lubricating Oil Monitoring Activities is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M39 Lubricating Oil Analysis, with the exception and enhancement identified above.

3. Parameters Monitored/Inspected:
The Oyster Creek Lubricating Oil Analysis program includes specifications for known oil degradation indicators and degradation characteristics, sampling and analysis frequencies, and corrective actions for control of lubricating oil properties. Lubricating oil physical properties are tested to standard ASTM and ISO methods, for the applicable oil type, to provide accurate quantitative numbers with repeatable results. Samples are taken and analyzed for indications of degraded chemical and physical properties depending on oil type and type of service. Analyses include: chemical parameters and viscosity, total acid number, total base number, rotating pressure vessel oxidation test, water demulsibility, particle count, fuel and combustion byproducts, sediment, water, anti-foaming characteristics, whole particle counting, air release and emission spectrum. Normal, alert, and fault levels for oil chemical and physical properties, wear metals, contaminants, and additives are established for the specific oil type and application.

Exception: The NUREG 1801 Rev. 1 XI.M39 Lubricating Oil Analysis program specifies that flash point be determined. The Oyster Creek Lubricating Oil Monitoring Activities Program does not measure flash point for all lubricating oils in service, since this 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 can be a measure to detect the contamination of lubricating oils by fuel oil, as is the case for diesel engine lubricating oil. Therefore, flash point will be measured for diesel engine lubricating oils only.

Enhancement: The Oyster Creek Lubricating Oil Monitoring Activities Program will be enhanced to include sampling for and measurement of Flash Point for diesel engine lubricating oil.

Result: This element of the Oyster Creek aging management program Lubricating Oil Monitoring Activities is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M39 Lubricating Oil Analysis, with the exception and enhancement identified above.

4. Detection of Aging Effects:
Monitoring activities maintain lubricating oil properties within predefined limits to both mitigate and detect the effects of aging. Oil analysis has become an accurate method for identifying specific wear mechanisms, contamination, and oil degradation characteristics within operating machinery. The program includes normal, alert, and fault action levels for oil chemical and physical properties, wear metals, contaminants, and additives, for the specific oil type and application. Increased impurities and degradation of oil properties indicate degradation of materials in lubricating oil systems. Monitoring of the diagnostic parameters indicates degradation due to aging effects prior to loss of intended function.

Result: This element of the Oyster Creek aging management program Lubricating Oil Monitoring Activities is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M39 Lubricating Oil Analysis, with the exception and enhancement identified above.

5. Monitoring and Trending:
Lubricating oil analysis results are monitored and trended to allow for the detection and identification of adverse trends prior to the occurrence of a loss of function event.

Result: This element of the Oyster Creek aging management program Lubricating Oil Monitoring Activities is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M39 Lubricating Oil Analysis, with the exception and enhancement identified above.

6. Acceptance Criteria:
Normal, alert, and fault levels have been established for the various chemical and physical properties, wear metals, additives, and contaminant levels based on information from oil manufacturers, equipment manufacturers, and industry guidelines, for the specific oil type and application. The program maintains contaminant and parameter limits within the application-specific limits. Plant procedures outline potential actions to be taken at alert and fault levels, and actions can be chosen based on the level of deviation. Aging effects or unacceptable results are evaluated and appropriate corrective actions are taken.

Particle concentration is determined in accordance with ISO 4406.

Result: This element of the Oyster Creek aging management program Lubricating Oil Monitoring Activities is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M39 Lubricating Oil Analysis, with the exception and enhancement identified above.

7. Corrective Actions:
Lubricating oil chemical and physical test results or contaminants outside the allowable limits are returned to the acceptable range within reasonable time periods as identified in industry guidelines. Evaluations are performed for test results that do not satisfy established criteria and an Issue Report is initiated to

document the concern in accordance with plant administrative procedures. The corrective actions program ensures that conditions adverse to quality are promptly 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.

Result: This element of the Oyster Creek aging management program Lubricating Oil Monitoring Activities is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M39 Lubricating Oil Analysis.

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.

Result: This element of the Oyster Creek aging management program Lubricating Oil Monitoring Activities is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M39 Lubricating Oil Analysis.

9. Administrative Controls:
See item 8 above.

Result: This element of the Oyster Creek aging management program Lubricating Oil Monitoring Activities is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M39 Lubricating Oil Analysis.

10. Operating Experience:
The overall effectiveness of lubricating oil monitoring activities is indicated by the Oyster Creek operating experience. Lubricating oil sampling and analysis have detected particulate or water contamination (or both) in lubricating oil systems. In some cases these events resulted in systems being declared inoperable until repaired, and until the oil was flushed or replaced. Operating experience has produced procedure and program changes, which have improved the effectiveness of lubricating oil testing and inspection activities.

In 2001, a Core Spray Pump oil analysis detected a high ratio of large to small particles after an oil change. Further investigation determined there had been no increase in pump vibration levels for an extended period, and that source of the particles in the changed oil was contamination from the reservoir when the oil change occurred. The condition did not render the pump inoperable, but continued operation with contaminated oil could have caused accelerated bearing wear, which would be indicated by increasing vibration levels. The reservoir was flushed to remove particles and new oil was added. An increased

oil surveillance frequency was established to confirm oil condition, and vibration data monitoring was performed as part of the scheduled preventive maintenance for the pump.
In 2002, while performing the fire pump operability test, the oil temperature stabilized two degrees higher than the allowed maximum temperature from the procedure. The system manager consulted with the vendor, and it was determined the procedure was too restrictive. The procedure was revised to conform with the vendor specifications.
In 2005, the potential for introducing improper bearing grease during motor refurbishing was recognized. Immediate action included cleaning and re-greasing. Follow-up actions included investigating improved vendor controls and updating of work instructions.

The operating experience of the Lubricating Oil Monitoring Activities program did not show any adverse trend in performance. Problems identified would not cause significant impact to the safe operation of the plant, and adequate corrective actions were taken to prevent recurrence. There is sufficient confidence that the implementation of the Lubricating Oil Monitoring Activities program will effectively maintain oil systems contaminants within acceptable limits, thereby preserving an environment that is not conducive to loss of material, cracking, or reduction of heat transfer. Periodic self-assessments of the Lubricating Oil Monitoring Activities program are performed to identify the areas that need improvement to maintain the quality performance of the program.

The Oyster Creek Lubricating Oil Monitoring Activities aging management program will provide assurance that the oil environment in the mechanical systems is maintained to the required quality. The program will provide reasonable assurance that system intended functions are maintained consistent with the current licensing basis during the period of extended operation.

Result: This element of the Oyster Creek aging management program Lubricating Oil Monitoring Activities is consistent with recommendations of the NUREG-1801 Revision 1 aging management program, XI.M39 Lubricating Oil Analysis.

Attachment 3

AMR Line Items Used in the Oyster Creek LRA for which "Further Evaluation" changed from "No" to "Yes" in the September 2005 Revision 1 GALL

AMR Line Items Used in the Oyster Creek LRA for which "Further Evaluation" changed from "No" to "Yes"

EP-34
V.D2-10, 3.2.1-24: Two new line items invoking One-Time Inspection for Reduction of Heat Transfer due to fouling will be added to the Oyster Creek LRA as a result of this change to the GALL.

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 January 2005 and has been changed in September 2005 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.

In the Oyster Creek LRA, there are 132 line item instances of One-Time Inspection of stainless steel components in a treated water environment. While these instances are applied to aging effects of loss of material or cracking, they provide ample inspection opportunity for the condition of the components – observed conditions that have the potential for impacting an intended function are evaluated and corrected as necessary in accordance with the corrective action process. Since one of the functions of the Water Chemistry program is to prevent or mitigate reduction of heat transfer due to fouling, a detected fouling condition on any of the components inspected for loss of material or cracking would also be identified and entered into the corrective action process. Thus there is high confidence that any instance of the Water Chemistry Program's failure to prevent fouling would be identified during the inspections for loss of material due to corrosion and cracking. However, since the Isolation Condenser tubes specifically will undergo eddy current testing during the first ten years of the period of extended operation, a One-Time Inspection for fouling of the internal surface of the tubes can be performed at that time. The Isolation Condenser shell side components undergo inspection for loss of material under the One-Time Inspection program; an inspection of the external surface of the tubes for reduction of heat transfer due to fouling will also be performed.

AP-54
VII.H1-6, 3.3.1-54: There is no change required to the Oyster Creek LRA due to this item change.

This line item for stainless steel piping elements in fuel oil, addressing loss of material due to corrosion, invoked the Fuel Oil Chemistry program with "No" further evaluation required in the January 2005 draft GALL. It has been changed in September 2005 to Fuel Oil Chemistry and One-Time Inspection, with "Yes" for evaluation of detected aging effects, to be consistent with other line items applicable to fuel oil environments. There are 6 instances of this line item being used, in the EDG and Auxiliary systems, and in Main F.O. Storage and Transfer system.

In the Oyster Creek LRA, four other Table 1 line items also specify the Fuel Oil Chemistry program to address loss of material due to corrosion in a fuel oil environment:

- A-30, 3.3.1-20 (with One-Time), for steel material, 49 instances in the EDG and Aux, Fire Protection, Main F.O. Storage, and SBO systems, Further Evaluation is "Yes" for evaluation of aging effects
- AP-44, 3.3.1-26 (with One-Time), for copper alloy material, 6 instances in the EDG and Aux, F.P., and Main F.O. Storage systems, Further Evaluation is "Yes" for evaluation of aging effects
- AP-35, 3.3.1-25 (with One-Time), for aluminum material, 6 instances in the EDG and Aux, and SBO systems, Further Evaluation is "Yes" for evaluation of aging effects
- A-28, 3.3.1-48 (with Fire Protection), for steel material, 6 instances in the F.P. and SBO systems, Further Evaluation is "No"

Numerous items in the EDG and Aux systems and Main F.O. Storage Systems are already subject to both the F.O. Chemistry and One-Time Inspection requirements for determination of loss of material due to corrosion. The basis for sample size for the One-Time Inspection program would not be significantly affected by the addition of the (comparatively few) AP-54 line items. Evaluations of any detected aging effects from inspections of those components, with observed conditions that have the potential for impacting an intended function evaluated and corrected as necessary in accordance with the corrective action process, provide ample opportunity for verification of the effectiveness of the F.O. Chemistry program with the One-Time Inspection program in these two systems.

AP-62
VII.A4-4 and VII.E3-6, 3.3.1-69: There is no change required to the Oyster Creek LRA due to this item change.

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 January 2005 and has been changed in September 2005 to the Water Chemistry and One-Time Inspection programs, with "Yes" for evaluation of aging effects. There are 2 instances of this line item being used, applicable to the treated water side of Shutdown Cooling System heat exchanger components evaluated in the Reactor Building Closed Cooling Water System (RBCCW) license renewal system.

In the Oyster Creek LRA, there are 229 line item instances of One-Time Inspection of stainless steel components in a treated water environment. While these instances are applied to aging effects of loss of material or cracking, they provide ample inspection opportunity for the condition of the components – observed conditions that have the potential for impacting an intended function are evaluated and corrected as necessary in accordance with the corrective action process. Since one of the functions of the Water Chemistry program is to prevent reduction of heat transfer due to fouling, a noted fouling condition on any of the inspected items would be identified and entered into the corrective action process. Thus there is high confidence that any instance of the Water Chemistry Program's failure to prevent fouling would be identified during the inspections for loss of material due to corrosion and cracking.

In addition, for the Shutdown Cooling System heat exchangers invoking this line item, the treated water environment is reactor coolant. The Water Chemistry program

requirements for reactor quality water provide added assurance that an environment conducive to fouling does not exist.

AP-64
VII.C2-5, 3.3.1-38: There is no change required to the Oyster Creek LRA due to this item change.

This line item for copper alloy piping elements in treated water, addressing loss of material due to corrosion, invoked the Closed-Cycle Cooling Water System program with "No" further evaluation required in January 2005 and has been changed in September 2005 to Water Chemistry and One-Time Inspection, with "Yes" for evaluation of detected aging effects. There are 4 instances of this line item being used, in the Condensate Transfer and Reactor Building Closed Cooling Water systems. In the Oyster Creek LRA, these 4 instances already specify the Water Chemistry and One-Time Inspection programs (with a standard "E" note stating that a different aging management program than was specified in January 2005 GALL was credited). Therefore, the Oyster Creek LRA implements the One-Time Inspection program and is consistent with GALL. Since observed conditions that have the potential for impacting an intended function are evaluated or corrected in accordance with the corrective action process, there is high confidence that the aging effect will be adequately managed.

T-01
3.5.1-21: There is no change required to the Oyster Creek LRA due to this item change.

For Inaccessible areas: As described in the UFSAR Section 3.8.4.6, "Materials, Quality Control and Special Construction Techniques", concrete is designed consistent with ACI 318 requirements to provide workable concrete of homogeneous structure which, when hardened, will have durability, impermeability and the specified strength. Testing of concrete was performed in accordance with ASTM Standards specified in ACI 318 to ensure the desired quality of concrete is furnished. The strength quality of the concrete was established by tests made in advance of the beginning of operations using a maximum slump of four inches. Specimens were tested and cured in accordance with ASTM C39.

The review of design and construction documents indicated that the specified air content is 4 to 6 percent. Water-to-cement ratio was based on the strength required by the design considering the maximum slump of four inches. Curves representing the relation between the water content and the average 28-day compressive strength were established for a range of values including the compressive strengths specified. The curves were established by at least three points, each point represented average values from at least four test specimens. The maximum allowable water content for each class of concrete was determined from the curves and corresponded to a compressive strength of 15 percent greater than that specified for that class of concrete. A review of documentation for a sample of class 4LA (4000 psi) concrete cylinder tests shows that the 28-day strength meets or exceeds the specified 4000 psi compressive strength.

Inspections conducted in accordance with the Structures Monitoring Program have identified minor loss of material (spalling, scaling) and cracking which could be attributed to freeze-thaw in accessible areas. Engineering evaluation of the identified loss of material and cracking concluded it is not significant to impact the intended function of the affected structure.

Based on above evaluation, we concluded that loss of material and cracking due to freeze-thaw is not significant for inaccessible areas. Thus a plant-specific aging management program is not required.

T-02
3.5.1-23: There is no change required to the Oyster Creek LRA due to this item change.

Further evaluation is only required for inaccessible areas if concrete was not constructed as stated (in accordance with the recommendations in ACI 201.2R). In the Oyster Creek LRA, the uses of this line item are not for inaccessible areas. Accessible areas inspections are performed in accordance with the Structures Monitoring Program, per September 2005 GALL.

T-03
3.5.1-21: There is no change required to the Oyster Creek LRA due to this item change.

The wording for further evaluation was changed from not required if within the scope of the applicant's structures monitoring program and stated conditions are satisfied for inaccessible areas, to required if not within the scope of the applicant's structures monitoring program, or concrete was not constructed as stated for inaccessible areas. This item is within the scope of Oyster Creek's Structures Monitoring Program, therefore further evaluation is not required.

T-04
3.5.1-21: There is no change required to the Oyster Creek LRA due to this item change.

The wording for further evaluation was changed from not required if within the scope of the applicant's structures monitoring program, to required if not within the scope of the applicant's structures monitoring program. This item is within the scope of Oyster Creek's Structures Monitoring Program, therefore further evaluation is not required.

T-06
3.5.1-21: There is no change required to the Oyster Creek LRA due to this item change.

The environment for this item, concrete: interior and above grade exterior, changed from "aggressive environment" to "air – indoor uncontrolled or air – outdoor". The wording for further evaluation was changed from not required if within the scope of the applicant's structures monitoring program, to required if not within the scope of the applicant's structures monitoring program. Each instance of use of this item is within the scope of Oyster Creek's Structures Monitoring Program, therefore further evaluation is not required.

T-08
3.5.1-27: There is no change required to the Oyster Creek LRA due to this item change.

Oyster Creek does not rely on a de-watering system for control of settlement. The wording for further evaluation was changed from not required if within the scope of the applicant's structures monitoring program, to required if not within the scope of the applicant's structures monitoring program. This item is within the scope of Oyster Creek's Structures Monitoring Program, therefore further evaluation is not required.

T-11
3.5.1-21: There is no change required to the Oyster Creek LRA due to this item change.

The wording for further evaluation was changed from not required if within the scope of the applicant's structures monitoring program, to required if not within the scope of the applicant's structures monitoring program. This item is within the scope of Oyster Creek's Structures Monitoring Program, therefore further evaluation is not required.

T-15
3.5.1-24: There is no change required to the Oyster Creek LRA due to this item change.

For inaccessible areas: As described in the UFSAR Section 3.8.4.6, "Materials, Quality Control and Special Construction Techniques", concrete is designed consistent with ACI 318 requirements to provide workable concrete of homogeneous structure which, when hardened, will have durability, impermeability and the specified strength. Testing of concrete was performed in accordance with ASTM Standards specified in ACI 318 to ensure the desired quality of concrete is furnished. The strength quality of the concrete was established by tests made in advance of the beginning of operations using a maximum slump of four inches. Specimens were tested and cured in accordance with ASTM C39.

The review of design and construction documents indicated that the specified air content is 4 to 6 percent. Water-to-cement ratio was based on the strength required by the design considering the maximum slump of four inches. Curves representing the relation between the water content and the average 28-day compressive strength were established for a range of values including the compressive strengths specified. The curves were established by at least three points, each point represented average values from at least four test specimens. The maximum allowable water content for each class of concrete was determined from the curves and corresponded to a compressive strength of 15 percent greater than that specified for that class of concrete. A review of documentation for a sample of class 4LA (4000 psi) concrete cylinder tests shows that the 28-day strength meets or exceeds the specified 4000 psi compressive strength.

Inspections conducted in accordance with the Oyster Creek RG. 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants have identified loss of material (spalling, scaling) and cracking which could be attributed to freeze-thaw in accessible areas. Engineering evaluation of the identified loss of material and cracking concluded it is not significant to impact the intended function of the affected structure.

Based on above evaluation, we concluded that loss of material and cracking due to freeze-thaw is not significant for inaccessible areas. Thus a plant-specific aging management program is not required.

T-16
3.5.1-24: There is no change required to the Oyster Creek LRA due to this item change.

The Oyster Creek LRA's commitment to perform inspections in accordance with Reg. Guide 1.127 does not change. This line item is not applied to inaccessible areas; therefore further evaluation is not required.

T-17
3.5.1-24: There is no change required to the Oyster Creek LRA due to this item change.

As described in the UFSAR Section 3.8.4.6, "Materials, Quality Control and Special Construction Techniques", the cement used for Oyster Creek was an approved brand of Portland Cement conforming to ASTM Specification C-150; Type II, low alkali. Alkali content is limited to 0.6 percent total alkali. The low alkali requirement for the cement was waived provided petrographic tests conducted in accordance with ASTM C295 and C227 demonstrated no potential alkali reactivity for all aggregates proposed for use. This provides reasonable assurance that aggregates do not react with reinforced concrete.

Additionally, the aggregate used on the project was from approved sources and consisted of clean, hard, durable particles conforming to the requirements of concrete specifications. Tests were performed as necessary to determine that the proposed aggregate would produce concrete of acceptable quality and durability, meeting ACI requirements.

T-18
3.5.1-24: There is no change required to the Oyster Creek LRA due to this item change.

Oyster Creek has committed to inspecting inaccessible areas of structures in the scope of license renewal that are exposed by excavation for any reason, and to sample and test groundwater periodically during the period of extended operation (Ref: AMP-168). This line item has been invoked for water control structures. Oyster Creek has committed to performing a baseline inspection of submerged water control structures prior to entering the period of extended operation. A second inspection will be performed 6 years after the baseline inspection. A third inspection will be performed 8 years after the second inspection. Following each inspection, the identified degradations will be evaluated to determine if more frequent inspections are warranted or there is a need for corrective actions to ensure that age related degradations are adequately managed (Ref: AMP-077). Inspections will be conducted in accordance with RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants.

The review of design and construction documents indicated that the specified air content is 4 to 6 percent. Water-to-cement ratio was based on the strength required by the design considering the maximum slump of four inches. Curves representing the relation between the water content and the average 28-day compressive strength were established for a range of values including the compressive strengths specified. The curves were established by at least three points, each point represented average values from at least four test specimens. The maximum allowable water content for each class of concrete was determined from the curves and corresponded to a compressive strength of 15 percent greater than that specified for that class of concrete. A review of documentation for a sample of class 4LA (4000 psi) concrete cylinder tests shows that the 28-day strength meets or exceeds the specified 4000 psi compressive strength.

Inspections conducted in accordance with RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants have identified cracking, change in material properties, and loss of material (spalling, scaling), which could be attributed to corrosion of embedded steel in accessible areas. Engineering evaluation of the

identified cracking, change in material properties, and loss of material concluded it is not significant to impact the intended function of the affected structure.

Based on above evaluation, we concluded that cracking, change in material properties, and loss of material due to corrosion of embedded steel is not significant for accessible and inaccessible areas, and RG. 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants will adequately manage the aging effect. Thus a plant-specific aging management program is not required.

T-19
3.5.1-24: There is no change required to the Oyster Creek LRA due to this item change.

Oyster Creek has committed to inspecting inaccessible areas of structures in the scope of license renewal that are exposed by excavation for any reason, and to sample and test groundwater periodically during the period of extended operation (Ref: AMP-168). This line item has been invoked for water control structures. Oyster Creek has committed to performing a baseline inspection of submerged water control structures prior to entering the period of extended operation. A second inspection will be performed 6 years after the baseline inspection. A third inspection will be performed 8 years after the second inspection. Following each inspection, the identified degradations will be evaluated to determine if more frequent inspections are warranted or there is a need for corrective actions to ensure that age related degradations are adequately managed (Ref: AMP-077). Inspections will be conducted in accordance with RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants.

Inspections conducted in accordance with RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants have identified concrete degradation, which could be attributed to aggressive chemical attack in accessible areas. Engineering evaluation of the identified identified increase in porosity and permeability, cracking, and loss of material concluded it is not significant to impact the intended function of the affected structure.

Based on above evaluation, we concluded that change in material properties, cracking, and loss of material (spalling, scaling) due to aggressive chemical attack is not significant for accessible and inaccessible areas, and RG. 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants will adequately manage the aging effect. Thus a plant-specific aging management program is not required.

T-29
3.5.1-33: There is no change required to the Oyster Creek LRA due to this item change.

The wording for further evaluation was changed from not required if within the scope of the applicant's structures monitoring program, to required if not within the scope of the applicant's structures monitoring program. This item is within the scope of Oyster Creek's Structures Monitoring Program, therefore further evaluation is not required.

T-30
3.5.1-33: There is no change required to the Oyster Creek LRA due to this item change.

The wording for further evaluation was changed from not required if within the scope of the applicant's structures monitoring program, to required if not within the scope of the

applicant's structures monitoring program. This item is within the scope of Oyster Creek's Structures Monitoring Program, therefore further evaluation is not required.

T-31
3.5.1-33: There is no change required to the Oyster Creek LRA due to this item change.

The wording for further evaluation was changed from not required if within the scope of the applicant's structures monitoring program, to required if not within the scope of the applicant's structures monitoring program. This item is within the scope of Oyster Creek's Structures Monitoring Program, therefore further evaluation is not required.

Attachment 4

AMR Line Items Used in the Oyster Creek LRA which were Deleted from the September 2005 Revision 1 GALL

20 Line Items used in OC LRA Now Deleted from September 2005 Revision 1 GALL

Twenty (20) Line Items used in the OCLR LRA have been deleted from September 2005 GALL.

Note: In the listings below, following the line item alphanumeric number and number of times the line item appears in the OC LRA, is a shortened description of the line item's content (structure and component description, material, environment, aging effect and mechanism, and GALL recommended program) for information. For the complete description, reference GALL.

1.) R-22 – (IV.C1-9; 35 line item occurrences): piping, components, elements ≥ 4NPS; stainless steel; reactor coolant; cracking/SCC/IGSCC; programs: BWR SCC, Water Chemistry

9/05 GALL Master list replacement: R-20

9/05 GALL states that CASS and SS share aging effects and mechanisms with the exception of CASS loss of fracture toughness due to thermal and neutron irradiation embrittlement; therefore CASS only needs to be listed when embrittlement is an issue. Consequently, 9/05 GALL R-20 deletes "CASS" (evidently intending that "SS" includes it when necessary), and concludes that R-22 is identical to R-20, therefore R-22 was deleted.

OC LRA effect: No changes required. The OC LRA line items using R-22 for SS have the same aging effects and mechanisms, and are covered by the same programs (BWR SCC and Water Chemistry), as R-20.

2.) R-55 – (IV.C1-2; 90 line item occurrences): Class 1 piping, branch connections < 4 NPS; SS, steel; reactor coolant; cracking/thermal and mechanical loading; programs: Section XI ISI, One-Time Inspection

9/05 GALL Master list replacement: R-03

9/05 GALL states that NRC staff requested that R-03 and R-55 be managed identically. Consequently, thermal/mechanical loading from R-55 was added to R-03, IGSCC was noted to apply to SS only (implying that SCC still applies to CS, which is not the position taken in the OC LRA, based on input from the peer review), and new program "One-Time Inspection of Class 1 Small-Bore Piping" was added to R-03's Section XI ISI and Water Chemistry, in lieu of a "plant specific" (for which the OC LRA uses One-Time Inspection as an equivalent inspection program).

OC LRA effect: No changes required. For SS piping, the OC LRA invoked R-03 and R-55 together, so for SS, the OC LRA is in compliance with the 9/05 GALL changes. For CS piping, the OC LRA invoked R-55 for cracking due to thermal and mechanical loading, but did not call out R-03, based on the peer review information that the January draft of GALL would be changed to not specify SCC to be considered for CS (and

chrome-moly). SCC was not deleted from CS material in the 9/05 GALL; therefore 9/05 GALL would specify Water Chemistry to be invoked via R-03 to manage stress corrosion cracking for CS (and chrome-moly) piping. However, in the OC LRA, for each environment of each component listing of piping, fittings, and valves where R-55 was invoked for cracking in CS and chrome-moly material, the Water Chemistry program is also invoked, to manage loss of material. Therefore, the programs specified by 9/05 GALL to manage SCC are invoked, and the OC LRA is equivalent to the specifications of 9/05 GALL.

3.) RP-02 – (IV.E-1; 9 line item occurrences): piping, components, elements; CASS; air indoor uncontrolled; None-None

9/05 GALL Master list replacement: No recommendation

OC LRA effect: No changes required. 9/05 GALL says nothing specifically about the deletion of RP-02, but does say elsewhere (in R-20) that CASS and SS are to be treated equivalently except where thermal or neutron irradiation embrittlement is an issue. RP-04 is identical to RP-02 but lists only SS, not specifically CASS. As in the discussion in R-20, GALL apparently expects RP-04 to cover CASS as well as SS, and eliminated RP-02 as redundant. The OC LRA is equivalent.

4.) E-16 – (V.D2-22; 4 line item occurrences): piping, components, elements; SS, treated water; cumulative fatigue; TLAA

9/05 GALL Master list replacement: E-10

9/05 GALL states that E-10 "is identical to E-16, so E-16 was deleted." However, E-10 is for "steel", E-16 was for "stainless steel."

OC LRA effect: No changes required. The OC LRA use of E-16 for SS invokes TLAA, just as E-10 does for "steel". The OC LRA is equivalent.

5.) E-32 – (V.C-8; 2 line item occurrences): Containment isolation piping and component internal surfaces; steel; untreated water; loss of material/corrosion/MIC; plant specific program

9/05 GALL Master list replacement: E-22

9/05 GALL states that changing E-32's "untreated water" to "raw water" made it a duplicate of E-22; therefore GALL deleted E-32. E-22's program is Open-Cycle Cooling Water, which GALL says manages steel in a raw water environment. The OC LRA used One-Time Inspection for E-32's "plant specific" program.

OC LRA effect: No changes required. The One-Time Inspection program the OC LRA invoked corresponds to inspections applied through the use of Open-Cycle Cooling. Open-Cycle Cooing addresses use of biocides to prevent MIC – the OC LRA's use of One-Time Inspection does not address this, however, the OC LRA invokes E-32 only in the Drywell Floor and Equipment Drain System, and addition of a biocide would not apply, because water in this portion of the drain system is treated water that has leaked out of its original system. MIC would not be a credible aging mechanism for this type of water environment. The OC LRA is equivalent.

6.) EP-21 – (V.F-18; 1 occurrence – Service Water system): piping, piping components, and piping elements; SS; lubricating oil; None-none

9/05 GALL Master list replacement: EP-51

9/05 GALL states that GALL now assumes water pooling in lubricating oil, which would create a potential for a plausible aging effect in SS. GALL now calls out the new Lubricating Oil Analysis program and One-Time Inspection for this line item.

OC LRA effect: No change required. The OC LRA's only use of this line item is in the lubricating oil system for the service water pumps, which are in continuous use – therefore pooling of any contamination water in the lubricating oil system is not credible, and a pooled water aging effect on the SS piping is not postulated to occur.

7.) A-11 – (VII.F3-6; 19 occurrences): ducting/piping internal surfaces; steel; air indoor uncontrolled; loss of material/corrosion; plant specific program

9/05 GALL Master list replacement: A-08

9/05 GALL states that changing the environment of A-08 from "air indoor uncontrolled" to "condensation internal", adding MIC to the aging mechanisms, and adding the new program "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components" to this line item in lieu of the "plant specific" program made it a duplicate of A-11, so A-11 was deleted.

OC LRA effect: No change required. The OC LRA used A-11 in 7 different systems, with 5 different plant specific programs depending on the application, including: None; Fire Protection; Fire Water; One-Time; Periodic Inspection; and Appendix J. The various inspections resulting from these programs provide a corresponding level of scrutiny as the new program. The "None" instances where no OC program was applied were for the Containment Inerting System and the Reactor Building Ventilation System, where past precedence was cited that said loss of material due to corrosion of carbon steel in a containment environment was not a credible aging effect due to the negligible amounts of free oxygen in a containment nitrogen environment.

8.) A-12 – (VII.F3-5; 15 occurrences): ducting, piping, component internal surfaces; SS; condensation internal; loss of material/corrosion; plant specific program

9/05 GALL Master list replacement: A-09

9/05 GALL states that removing "external" from the structure/component description and environment of A-09 made it a duplicate of A-12, so GALL deleted A-12.

OC LRA effect: No change required. The OC LRA used One-Time Inspection as the plant specific program which would be no different had it invoked A-09. The OC LRA is equivalent.

9.) A-13 – (VII.F3-3, 1 occurrence; VII.F4-3, 2 occurrences): ducting/piping internal surfaces; steel; condensation internal; loss of material/corrosion and MIC; plant specific program

9/05 GALL Master list replacement: A-08

9/05 GALL stated that changing the environment of A-08 from "air indoor uncontrolled" to "condensation internal", adding MIC to the aging mechanisms, and adding the new program "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components" to this vs. "plant specific" program made it a duplicate of A-13, so A-13 was deleted.

OC LRA effect: No change required. The OC LRA used A-13 in 2 different systems, with periodic inspection called out as the plant specific program. The periodic inspection is equivalent to the inspections of opportunity described in the new GALL program.

10.) A-31 – (VII.C3-10; 2 occurrences); piping, components, elements; steel; raw water; loss of material/corrosion and MIC; open-cycle cooling

9/05 GALL Master list replacement: A-38

9/05 GALL states that A-38 encompasses A-31 and therefore A-31 is not needed. A-38 also applies to lined or unlined piping, and includes fouling and lining degradation.

OC LRA effect: No change required. The OC LRA's two instances of A-31 both used an "E" alternate program (Structures Monitoring for the intake structure, and One-Time Inspection, in conjunction with the Selective Leaching of Materials program for the Raw Water-Fresh Water environment in Sanitary Waste). These programs' inspections correspond to those of the Open-Cycle Cooling Water program, and are more appropriate for these two applications. The OC LRA is equivalent.

11.) A-32 – (VII.C1-18; 28 occurrences); piping, components, elements; steel; raw water; loss of material/corrosion, fouling, and MIC; open-cycle cooling

9/05 GALL Master list replacement: A-38

9/05 GALL states that A-38 encompasses A-32 and therefore A-32 is not needed. A-38 also applies to lined or unlined piping, and includes lining degradation.

OC LRA effect: No change required. The OC LRA's instances of invoking A-32 either use Open-Cycle Cooling, or they use One-Time Inspection (to confirm absence of aging effects in pooled or stagnant areas of drain piping) or Periodic Inspections with an "E" standard note and plant specific note. Their use is justified for the application and environment, and results in equivalent scrutiny.

12. A-36 – (VII.F2-7, 6 occurrences; VII.F3-7, 4 occurrences; VII.F1-8, 3 occurrences): elastomer seals and components; elastomers; air indoor uncontrolled (external); hardening – loss of strength/degradation; plant specific program

9/05 GALL Master list replacement: A-17

9/05 GALL changed the environment of A-17 to be both internal and external, therefore A-36 was redundant and deleted.

OC LRA effect: No change required. The OC LRA invokes various plant specific programs depending on the application and they remain valid. The OC LRA is equivalent.

13. A-37 – (VII.E4-18; 1 line item occurrence): piping, components, elements; steel, treated water; cumulative fatigue; TLAA

9/05 GALL Master list replacement: A-62

9/05 GALL states that A-62 is the same as A-37, so A-37 was deleted. However, A-62 is for "stainless steel", A-37 was for "steel."

OC LRA effect: No changes required. The OC LRA's use of A-37 for steel invokes TLAA, just as A-62 does for "stainless steel". The OC LRA is equivalent.

14. AP-29 – (VII.G-14, 6 occurrences; VII.C1-12, 1 occurrence): piping, components, elements; gray C.I.; untreated water; loss of material/selective leaching; Selective Leaching

9/05 GALL Master list replacement: A-51

9/05 GALL changed "untreated water" to "raw water"; AP-29 was a duplicate to A-51 after this change so AP-29 was deleted.

OC LRA effect: No changes required. The OC LRA invokes Selective Leaching for AP-29, so it is equivalent to A-51.

15. AP-57 – (VII.K-7, 12 occurrences; VII.E3-17, 46 occurrences): piping, components, elements; SS; treated water; loss of material/corrosion; plant specific program

9/05 GALL Master list replacement: A-58

9/05 GALL states that AP-57 was modified to transfer Related Item "E3" to A-58, however 9/05 GALL deleted AP-57 entirely, apparently intending that A-58 be used.

OC LRA effect: No change required. The OC LRA's use of AP-57 invokes water Chemistry and One-Time inspection as the plant specific programs in every case except one, where Generator Stator Water Chemistry is used equivalently to Water Chemistry. The actions for AP-57 are equivalent to those of A-58.

16. AP-69 – (VII.K-5, 20 line item occurrences): piping, components, elements; steel; treated water; loss of material/corrosion; plant specific program

9/05 GALL Master list replacement: No recommendation

OC LRA effect: No changes required. GALL items A-35, S-09, and E-08 are all similar, and each specifies Water Chemistry and One-Time Inspection programs. The OC LRA's only use of AP-69 is in the Main Generator and Auxiliaries system, and the programs specified are Generator Stator Water Chemistry and One-Time Inspection. These supply equivalent inspection requirements.

17. AP-7 – (VII.J-3, 1 line item occurrence): piping, components, elements; CASS; air indoor uncontrolled (external); None-none

9/05 GALL Master list replacement: No recommendation

OC LRA effect: No changes required. 9/05 GALL says nothing specifically about the deletion of AP-7, but does say elsewhere (in R-20) that CASS and SS are to be treated equivalently except where thermal or neutron irradiation embrittlement is an issue. AP-17 is identical to AP-7 but lists only SS, not specifically CASS. As in the discussion in R-20, GALL apparently expects AP-17 to cover CASS as well as SS, and eliminated AP-7 as redundant. The action taken is equivalent.

18. AP-70 – (VII.K-1, 11 line item occurrences): piping, components, elements; copper alloy, treated water, loss of material/corrosion; plant specific program

9/05 GALL Master list replacement: AP-32

9/05 GALL states that AP-32 is a "counter-part to AP-70"; AP-70 has been deleted from GALL.

OC LRA effect: No change required. AP-32 is not a replacement for AP-70. AP-32 addresses loss of material through selective leaching by invoking Selective Leaching for copper alloys with > 15% zinc. AP-70 addresses loss of material through pitting and crevice corrosion for copper alloys by invoking a "plant specific" program. The OC LRA's use of AP-70 invoked One-Time Inspection and, where applicable, Water Chemistry, *and* also specified AP-32 for each instance where the copper alloy was subject to selective leaching. The OC LRA is therefore in compliance with GALL.

19. SP-51 – (VIII.J-2, 20 line item occurrences): piping, components, elements; steel; raw water; loss of material/general, pitting, crevice corrosion and MIC; plant specific program

9/05 GALL Master list replacement: No recommendation

OC LRA effect: No changes required. No GALL explanation is given for deletion of SP-51. Similar GALL line items (all address steel in raw water) include A-31, A-32, A-33, A-38, and E-22, which specify Open Cycle Cooling, Fire Water System, or plant specific programs. All instances of line item SP-51's use in the OC LRA are in floor drain systems, and the OC LRA specifies the One-Time Inspection program as the plant specific program for detecting the loss of material aging effect due to corrosion (to confirm absence of aging effects in pooled or stagnant areas of drain piping). The One-Time Inspection program provides an equivalent level of scrutiny as the programs used in the similar line items listed above.

20. SP-52 – (VIII.J-1, 13 line item occurrences): piping, components, elements; SS; raw water; loss of material/pitting and crevice corrosion; plant specific program

9/05 GALL Master list replacement: No recommendation

OC LRA effect: No changes required. No GALL explanation is given for deletion of SP-52. Similar GALL line items (all address SS in raw water) include A-53, A-54, A-55, AP-

55, and SP-36, which specify Open Cycle Cooling or Fire Water System programs. All instances of line item SP-52's use in the OC LRA are in floor drain systems, and the OC LRA specifies the One-Time Inspection program as the plant specific program for detecting the loss of material aging effect due to corrosion (to confirm absence of aging effects in pooled or stagnant areas of drain piping). The One-Time Inspection program provides an equivalent level of scrutiny as the programs used in the similar line items listed above.

Attachment 5

AMR Line Items used in the Oyster Creek LRA for which Changes in the September 2005 Revision 1 GALL were not solely Administrative

"Non-Administrative" Changes to Line Items from January 2005 Draft GALL to September 2005 Revision 1 GALL
(Items Not Previously Identified by Further Evaluation Changing from No to Yes)

1. A-104: Program was Plant Specific, now Bolting Integrity (VII.E1-1, 1 occurrence)
   OC LRA effect: None – OC LRA used Bolting Integrity for this occurrence of A-104

2. A-50: Programs were Closed Cycle Cooling Water and Selective Leaching; now just Selective Leaching (CCCW removed) (VII.C2-7, 14 occurrences)
   OC LRA effect: None – OC LRA is conservative in specifying both CCCW and SL

3. A-63: Galvanic Corrosion added as aging mechanism to general, pitting, and crevice corrosion for steel heat exchanger components (VII.C2-1, 15 occurrences)
   OC LRA effect: None – CCCW is used for A-63 to identify corrosion as recommended by GALL and would identify the effects of galvanic corrosion

4. A-64: Galvanic Corrosion added as aging mechanism to general, pitting, crevice corrosion, and MIC for steel heat exchanger components (VII.C2-3, 2 occurrences)
   OC LRA effect: None – OCCW is used for A-64 to identify corrosion as recommended by GALL and would identify the effects of galvanic corrosion

5. A-65: Galvanic Corrosion added as aging mechanism to pitting and crevice corrosion, MIC, and fouling for copper alloy heat exchanger components (VII.C1-1, 2 occurrences)
   OC LRA effect: None – The Fire Water System program is used for A-65 to identify corrosion and would identify the effects of galvanic corrosion

6. AP-30: Program was Plant Specific, now Lubricating Oil Analysis augmented by One-Time Inspection (VII.E4-17, 24 occurrences; H2-20, 30 occurrences.; C2-13, 4 occurrences.; G-20, 4 occurrences.; F4-14, 1 occurrence.)
   OC LRA effect: None – OC LRA uses the corresponding Lubricating Oil Monitoring and One-Time Inspection programs for all occurrences except the one F4-14 occurrence, which is in the EDG system and subject to the Periodic Inspection program. Use of the Periodic Inspection program for the EDG system, in conjunction with the large number of existing samples of components subject to the OC Lubricating Oil Monitoring and One-Time Inspection programs support the conclusion that the programs adequately manage the subject aging effect of loss of material due to corrosion.

7. AP-39: Program was Plant Specific, now Lubricating Oil Analysis augmented by One-Time Inspection (VII.H2-3, 6 occurrences)
   OC LRA effect: None – OC LRA uses the corresponding Lubricating Oil Monitoring and One-Time Inspection programs. This is in compliance with September 2005 GALL.

8. AP-47: Deleted Galvanic Corrosion aging mechanism; program was Plant Specific, now Lubricating Oil Analysis augmented by One-Time Inspection (VII.H2-10, 10 occurrences; C1-6, 6 occurrences)
   OC LRA effect: None – OC LRA uses the corresponding Lubricating Oil Monitoring and One-Time Inspection programs. This is in compliance with September 2005 GALL.

9. AP-59: Program was Plant Specific, now Lubricating Oil Analysis augmented by One-Time Inspection (VII.H2-17, 14 occurrences)
   OC LRA effect: None – OC LRA uses the corresponding Lubricating Oil Monitoring and One-Time Inspection programs. This is in compliance with September 2005 GALL.

10. C-12: Programs were ASME Section XI IWE, Appendix J, and Protective Coating Monitoring and Maintenance if credited, now Protective Coating program is deleted (II.B4-1, 19 occurrences)

OC LRA effect: None – OC LRA uses IWE and Appendix J programs in each occurrence, and the Protective Coatings program where credited; this matches the September 2005 GALL and use of the Protective Coatings program is conservative

11. C-15: Not a significant change (environment adds "outdoor") (II.B4-2, 12 occurrences)
    OC LRA effect: None – OC LRA applications of this line item are for indoor air or containment atmosphere.

12. C-16: Programs were ASME Section XI IWE, Appendix J, and Protective Coating Monitoring and Maintenance if credited, now Protective Coating program is deleted (II.B4-5, 10 occurrences)
    OC LRA effect: None – OC LRA uses IWE and Appendix J programs in each occurrence, and the Protective Coatings program where credited; this matches the September 2005 GALL and use of the Protective Coatings program is conservative.

13. C-19: Programs were ASME Section XI IWE, Appendix J, and Protective Coating Monitoring and Maintenance if credited, now Protective Coating program is deleted (II.B1.1-2, 62 occurrences)
    OC LRA effect: None – OC LRA uses IWE and Appendix J programs in each occurrence, and the Protective Coatings program where credited; this matches the September 2005 GALL and use of the Protective Coatings program is conservative.

14. C-22: Not a significant change (wording clarification in GALL AMP recommendation) (II.B1.1-5, 12 occurrences)
    OC LRA effect: None – OC LRA applications of this line item use the aging management programs specified by September 2005 GALL (ASME Section XI, Subsection IWE and Appendix J).

15. C-23: Graphite plate deleted from applicable material, steel remains (II.B1.1-1, 1 occurrence)
    OC LRA effect: None – OC LRA only used this item for steel

16. E-33: Program was Plant Specific, now Water Chemistry augmented by One-Time Inspection (V.C-4, 4 occurrences)
    OC LRA effect: None – OC LRA uses the Water Chemistry program augmented by the One-Time Inspection program

17. E-42: Added "with or without coating or wrapping" to steel pipe material, and added MIC aging mechanism (V.B-8, 1 occurrence)
    OC LRA effect: None – OC LRA uses Buried Pipe Inspection per GALL to manage this aging effect of loss of material

18. EP-24: Not a significant change (replaces stress relaxation with thermal effects, gasket creep, and self-loosening to mechanisms)

19. EP-32: Program was Plant Specific, now Water Chemistry augmented by One-Time Inspection (V.D2-23, 110 occurrences)
    OC LRA effect: None – OC LRA uses the Water Chemistry program augmented by the One-Time Inspection program

20. LP-01: Change to name of GALL recommended program (VI.A-8, 1 occurrence)
    OC LRA effect: None – OC LRA states that 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 OC LRA Subsection 3.6.2.3.1 for additional information.

21. LP-04: Change to name of GALL recommended program (VI.A-11, 1 occurrence)

OC LRA effect: None – OC LRA states that 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.

22. LP-05: Change to name of GALL recommended program (VI.A-14, 1 occurrence)
OC LRA effect: None – OC LRA states that 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.

23. LP-07: AMP note added: Program was Plant Specific, now Plant Specific for plants located such that the potential exists for salt deposits or surface contamination (VI.A-9, 2 occurrences)
OC LRA effect: None – OC LRA states that high voltage insulators do not experience degradation of insulator quality due to the presence of salt deposits and surface contamination identified in NUREG-1801. See OC LRA subsection 3.6.2.2.5 for further information.

24. R-04: Structure/component list revised to delete piping, piping components, and piping elements, heater sheaths and sleeves, pump casings and covers, and pressure housings; revised to add reactor vessel components, nozzles, and safe ends. Material list revised to delete CASS, presumably for the reasons listed for R-20 (SS and CASS share aging effects and mechanisms – CASS only needs to be identified when thermal or neutron embrittlement is an issue) (IV.A1-6, 23 occurrences; IV.C1-11, 61 occurrences)
OC LRA effect: None – OC LRA uses the TLAA AMP in accordance with September 2005 GALL to manage this aging effect. September 2005 GALL added line item R-220 to address the piping, piping components and piping elements removed from R-04; the material, environment, aging effect/mechanism, and program (TLAA) for R-220 are the same as those invoked by the OC LRA.

25. R-15: Deleted steel as a material from Isolation condenser components, SS remains as material. No change to programs (IV.C1-5, 2 occurrences)
OC LRA effect: None – both occurrences in the OC LRA are for the isolation condenser system and are for SS components, in accordance with September 2005 GALL.

26. R-16: In the January 2005 Draft GALL, programs were ASME Section XI IWB/C/D for Class 1 components and Water Chemistry, with augmentation consisting of isolation condenser shell water temperature and radiation monitoring, and eddy current testing of tubes, and verification of effectiveness of the program; in the September 2005 Rev. 1 GALL, programs specified are Water Chemistry and One-Time Inspection (IV.C1-6, 2 occurrences)
OC LRA effect: None – OC LRA credits inspections under Section XI ISI in lieu of September 2005 GALL's One-Time Inspection; Water Chemistry is also specified. In addition, OC has committed to isolation condenser shell water temperature and radiation monitoring, and eddy current testing of tubes, and verification of effectiveness of the program (as continues to be specified by GALL for the cracking aging effect under line item R-15), and these programs in conjunction with the large number of existing samples of components subject to the Water Chemistry and One-Time Inspection programs support the conclusion that the programs adequately manage the subject aging effect of loss of material.

27. R-27: Deletes "High-Strength" qualifier from the material, adds thermal effects, gasket creep, and self-loosening to mechanisms (IV.C1-12, 1 occurrence)
OC LRA effect: None – OC LRA uses the Bolting Integrity program in accordance with GALL to manage the loss of preload aging effect

28. R-53: Deletes CASS from material, presumably for the reasons listed for R-20 (SS and CASS share aging effects and mechanisms – CASS only needs to be identified when thermal or neutron embrittlement is an issue) (IV.B1-14, 20 occurrences)

OC LRA effect: None – SS, CASS, and nickel alloy material components in the OC LRA identify this line item for cumulative fatigue, specifying the TLAA program, and continue to be in compliance with GALL.

29. R-98: Adds inspection specifications for top guides if fluence exceeds the IASCC threshold amount (IV.B1-16, 2 occurrences)
    OC LRA effect: None – OC has top guides that have exceeded the IASCC threshold – the use of the R-98 line item in the LRA includes a plant specific note identifying that enhanced inspections are to be performed, and these inspections are discussed in Appendix B for B.1.9 (BWR Vessel Internals program). The September GALL specifications are incorporated.

30. S-08: Adds treated water environment, was steam only (VIII.B2-3, 2 occurrences)
    OC LRA effect: None

31. S-13: Adds steel to SS for material of tanks (VIII.E-32, 2 occurrences)
    OC LRA effect: None

32. S-18: Deletes "shell side" or "tube side" specificity for heat exchangers (VIII.E-3, 14 occurrences)
    OC LRA effect: None – Water Chemistry and One-Time Inspection programs are used as specified by September 2005 GALL

33. S-21: Deletes "shell side" or "tube side" specificity for heat exchangers (VIII.E-2, 8 occurrences)
    OC LRA effect: None – Water Chemistry and One-Time Inspection programs are used as specified by September 2005 GALL

34. S-23: Deletes "shell side" or "tube side" specificity for heat exchangers, adds galvanic corrosion to aging mechanism (VIII.E-6, 4 occurrences)
    OC LRA effect: None – Closed Cycle Cooling Water program is used as specified by September 2005 GALL

35. S-25: Deletes "shell side" or "tube side" specificity for heat exchangers (VIII.E-4, 1 occurrence)
    OC LRA effect: None – Closed Cycle Cooling Water program is used as specified by September 2005 GALL

36. S-33: Adds thermal effects, gasket creep, and self-loosening to mechanisms (VIII.H-5, 10 occurrences)
    OC LRA effect: None – Bolting Integrity program is used as specified by September 2005 GALL

37. SP-16: September 2005 Revision 1 GALL deleted the PWR qualifier (VIII.D2-4, 44 occurrences)
    OC LRA effect: None – OC LRA applied this line item even though January 2005 GALL listed it as a PWR program. The OC LRA is in compliance with the September 2005 GALL which removed the PWR qualifier.

38. SP-25: Program was Plant Specific, now Lubricating Oil Analysis augmented by One-Time Inspection (VIII.D2-5, 10 occurrences; VIII.A-3, 26 occurrences)
    OC LRA effect: None – OC LRA uses the corresponding Lubricating Oil Monitoring and One-Time Inspection programs. This is in compliance with September 2005 GALL.

39. SP-38: Program was Plant Specific, now Lubricating Oil Analysis augmented by One-Time Inspection (VIII.A-2, 12 occurrences)
    OC LRA effect: None – OC LRA uses the corresponding Lubricating Oil Monitoring and One-Time Inspection programs. This is in compliance with September 2005 GALL.

40. TP-8: Galvanized steel removed from material, now only aluminum; aging effect/mechanism was loss of material/galvanic corrosion, now None; program was Structures Monitoring, now None (III.B5-2, 1 occurrence; III.B1.2-3, 2 occurrences; III.B2-4, 26 occurrences)
OC LRA effect: None – OC LRA uses this item for galvanized steel material components with no aging effect and no program specified, explained with an "I" standard note. This is in conformance with September 2005 GALL, in which new line item TP-11 has been added to address the galvanized steel material removed from TP-8, and lists aging effect and program of None – None.

41. T-14: Aging Management Program Description continues to specify Water Chemistry program and monitoring of the spent fuel pool water level, and adds clarification of "in accordance with technical specifications and leakage from the leak chase channels" (III.A5-13, 2 occurrences)
OC LRA effect: None – OC LRA invokes the Water Chemistry program in continued compliance with GALL. The OC spent fuel pool water level is a Technical Specification-controlled parameter. Pool leak chase piping is routed to a monitoring location and includes individual valving to provide detection of any leakage. Oyster Creek will commit to monitoring any leakage at this location. This remains in compliance with GALL.

Attachment 6

AMR Line Items used in the Oyster Creek LRA which invoke Plant-Specific Programs Requiring Further Evaluation in both the January 2005 Draft and September 2005 Revision 1 SRP

AMR Line Items used in the Oyster Creek LRA which invoke Plant-Specific Programs Requiring Further Evaluation in both the January 2005 Draft and September 2005 Revision 1 SRP

	Line Item No.	January 05 Draft SRP section	September 05 Revision 1 SRP section	Further Evaluation Significant Change
1	A-09	3.3.2.2.10.2	3.3.2.2.10.5	No
2	A-16	3.3.2.2.5.2	3.3.2.2.5.2	No
3	A-17	3.3.2.2.5.1	3.3.2.2.5.1	No
4	A-18	3.3.2.2.13	3.3.2.2.13	No
5	A-27	3.3.2.2.7.3	3.3.2.2.7.3	No
6	A-46	3.3.2.2.10.2	3.3.2.2.10.3	No
7	A-71	3.3.2.2.3.2	3.3.2.2.3.2	No
8	A-73	3.3.2.2.13	3.3.2.2.13	No
9	A-85	3.3.2.2.3.2	3.3.2.2.3.2	No
10	A-89	3.3.2.2.14	3.3.2.2.6	No
11	AP-33	3.3.2.2.3.2	3.3.2.2.3.3	No
12	E-06	3.2.2.2.5	3.2.2.2.5	No
13	LP-07	3.6.2.2.5	3.6.2.2.2	No
14	LP-08	3.6.2.2.6	3.6.2.2.3	No
15	LP-11	3.6.2.2.5	3.6.2.2.2	No
16	R-61	3.1.2.2.4.2	3.1.2.2.4.1	No
17	RP-18	3.1.2.2.11	3.1.2.2.11	No
18	SP-37	3.4.2.2.7.2	3.4.2.2.7.2	No

Attachment 7

Evaluation of Line Items Added by the September 2005 Revision 1 GALL (Items not previously included in the January 2005 Draft GALL)

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
AP-73	Piping, piping components, and piping elements	Stainless steel	Sodium pentaborate solution	Loss of material/ pitting and crevice corrosion	Chapter XI.M2, "Water Chemistry," for BWR waterThe AMP is to be augmented by verifying the effectiveness of water chemistry *control. See Chapter* XI.M32, "One-Time Inspection," for an acceptable verification program.	A-58	Piping and fittings, tanks, thermowells, and valve bodies	Stainless steel	Sodium pentaborate	Loss of material	Water Chemistry program (B.1.2) and the One-Time Inspection program (B.1.24) to verify the effectiveness of water chemistry control.	Line Item A-58 is for treated water environment but was applied to sodium pentaborate. The AMR included plant specific note: The Aging Management Programs for the aging effect of "Loss of Material" in the Treated Water environment identified in the referenced NUREG-1801 Volume 2 Item column were applied to the Sodium Pentaborate environment since Sodium Pentaborate approximates Treated Water in aggressivity as identified in NUREG-1801 Volume 2 Chapter IX.
AP-74	Piping, piping components, and piping elements	Aluminum	Condensation	Loss of *material/* pitting and crevice corrosion	A plant-specific aging *management program* is to be evaluated.	N/A	N/A	N/A	N/A	N/A	N/A	The material and environment *combination of aluminum and* condensation is not applicable.
AP-75	Elastomer seals and components	Elastomers	Raw water	Hardening and loss of strength/ elastomer degradation	Chapter XI.M20, "Open Cycle Cooling Water System"	N/A	Expansion joints	Elastomer	Raw water - fresh water and raw water - salt water	Change in material properties	Periodic Inspection Program (B.2.5)	The plant specific Periodic Inspection Program provides for the identification of cracking, hardening, or tears in elastomer expansion joints in raw water - salt water and raw water - fresh water environments.
AP-76	Elastomer seals and components	Elastomers	Raw water	Loss of material/erosion	Chapter XI.M20, "Open Cycle Cooling Water System"	N/A	N/A	N/A	N/A	N/A	N/A	Oyster Creel LRA Table 3.0-4 for elastomers defines change in material properties as increased hardness, shrinkage and loss of strength due to weathering and hardening and loss of strength due to elastomer degradation. Change in material properties does not inlude loss of material due to erosion. Table 3.0-4 does not define loss of material for elastomers (non-metallics). The periodic inspections performed for "change in material properties" would identify the loss of material.
AP-77	Heat exchanger tubes	Steel	Closed cycle cooling water	Reduction of heat transfer/ fouling	Chapter XI.M21, "Closed-Cycle Cooling Water System"	N/A	Coolers and heat exchanger tubes	Carbon steel and cast iron	Closed Cooling Water	Reduction of Heat Transfer	Closed-Cycle Cooling Water System (B.1.14)	None.

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
AP-78	Piping, piping components, and piping elements	Copper alloy	Condensation (Internal)	Loss of material/ pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	N/A	N/A	N/A	N/A	N/A	N/A	The material and environment combination of copper alloy and condensation is not applicable.
AP-79	Piping, piping components, and piping elements	Stainless Steel; Steel with stainless steel cladding	Treated borated water	Loss of material/ pitting and crevice corrosion	Chapter XI.M2, "Water Chemistry," for PWR primary water	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWRs only.
AP-80	Heat exchanger tubes	Copper Alloy	Closed cycle cooling water	Reduction of heat transfer/ fouling	Chapter XI.M21, "Closed-Cycle Cooling Water System"	N/A	Shutdown Cooling Pumps seal coolers (RBCCW LR System)	Copper	Closed Cooling Water	Reduction of Heat Transfer	Closed-Cycle Cooling Water System (B.1.14)	Addressed with a non-GALL item invoking CCCW for SDC pump seal coolers in OC LRA. 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 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. Addition of this line item to the Emergency Diesel Generator and Auxiliary System AMR is required.

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
AP-81	Piping, piping components, and piping elements	Stainless steel	Condensation	Loss of material/ pitting and crevice corrosion	Chapter XI.M24, "Compressed Air Monitoring"	A-12	Drain traps, drip legs, filter housings, flow elements, heat exchanger coils, moisture separators, piping and fittings, pump casings, tanks, valve bodies, and water separators	Stainless steel	Condensation	Loss of material	One-Time Inspection (B.1.24)	The stainless steel components in the Hydrogen & Oxygen Monitoring (H2O2) System and the Nitrogen Supply (N2) System subject to condensation environments are associated with moisture removal portions of the systems and are not associated with compressed air systems. In the H2O2 System, moisture is removed from the containment atmosphere, which is inerted with nitrogen, prior to entering the H2O2 monitoring equipment. In the N2 System, moisture is removed from the containment atmosphere, which is inerted with nitrogen, prior to entering TIP nitrogen purge instrumentation. In both cases, impurities and oxygen content are low, thus, significant aging effects on stainless steel are not anticipated. The One-Time Inspection aging management program will be used to provide additional assurance that aging that has not yet manifested itself is not occurring, or that the evidence of aging shows that the aging is so insignificant that an aging management program is not warranted.
AP-82	Piping, piping components, piping elements, and tanks	Stainless steel	Treated borated water >60°C (>140°F)	Cracking/ stress corrosion cracking	Chapter XI.M2, "Water Chemistry," for PWR primary water	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWR's only.
AP-83	Piping, piping components, and piping elements	Aluminum	Raw water	Loss of material/ pitting and crevice corrosion	Chapter XI.M26, "Fire Protection"	N/A	Water Motor Alarm	Aluminum	Raw water - fresh water	Loss of material	Fire Water System (B.1.20)	The Oyster Creek Fire Water System (B.1.20) aging management program applies to water-based fire protection systems that consist of sprinklers, nozzles, fittings, valves, hydrants, hose stations, standpipes, water storage tanks, and aboveground and underground piping and components that are tested in accordance with the applicable National Fire Protection Association (NFPA) codes and standards or approved Fire Protection Program commitments.

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
AP-85	Pump Casings	Steel with stainless steel cladding	Treated borated water	Loss of material/ cladding breach	A plant-specific aging management program is to be evaluated.Reference NRC Information Notice 94-63, "Boric Acid Corrosion of Charging Pump Casings Caused by Cladding Cracks."	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWRs only.
C-25	Concrete:Basemat	Concrete	Ground water/soil	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)/ aggressive chemical attack	Chapter XI.S2, "ASME Section XI, Subsection IWL".Accessible Areas:Inspections performed in accordance with IWL will indicate the presence of increase in porosity and permeability, surface cracking, or loss of material (spalling, scaling) due to aggressive chemical attack.Inaccessible Areas:For plants with non-aggressive ground water/soil; i.e., pH > 5.5, chlorides < 500 ppm, or sulfates <1500 ppm, as a minimum, consider (1) Examination of the exposed portions of the below grade concrete, when excavated for any reason, and(2) Periodic monitoring of below-grade water chemistry, including	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
					consideration of potential seasonal variations.For plants with aggressive groundwater/soil, and/or where the *concrete structural* elements have experienced degradation, a plant specific AMP accounting for the extent of the degradation experienced should be implemented to manage the concrete aging during the period of extended operation.							
C-26	Concrete:Containment; *wall; basemat*	Concrete	Ground water/soil *or air-indoor* uncontrolled or air-outdoor	Increase in *porosity and* permeability, cracking, loss of material (spalling, scaling)/ aggressive chemical attack	Chapter XI.S2, "ASME *Section XI, Subsection* IWL"Accessible Areas:Inspections performed in accordance with IWL will indicate the presence of increase in porosity and permeability, surface cracking, or loss of material (spalling, scaling) due to aggressive chemical attack.Inaccessible Areas:For plants with non-aggressive ground water/soil; i.e., pH > 5.5, chlorides < 500 ppm, or sulfates <1500 ppm, as a minimum, consider (1) Examination of the exposed portions of the below grade concrete, when excavated for any reason, and(2) Periodic monitoring of below-grade water chemistry, including	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
					consideration of *potential* seasonal variations.For plants with aggressive groundwater/soil, and/or where the concrete structural elements have experienced degradation, a plant specific AMP accounting for the extent of the degradation experienced should be implemented to manage the concrete *aging during the period* of extended operation.							
C-27	Concrete:Dome; wall; basemat	Concrete	Ground water/soil or air-indoor uncontrolled or air-outdoor	Increase in porosity and permeability, cracking, loss of material (spalling, scaling)/ aggressive chemical attack	Chapter XI.S2, "ASME Section XI, Subsection IWL"Accessible Areas:Inspections performed in accordance with IWL will indicate the presence of increase in porosity and permeability, surface cracking, or loss of material (spalling, scaling) due to aggressive chemical attack.Inaccessible Areas:For plants with non-aggressive ground water/soil; i.e., pH > 5.5, chlorides < 500 ppm, or sulfates <1500 ppm, as a minimum, consider (1) Examination of the exposed portions of the below grade concrete, when excavated for any reason, and(2) Periodic monitoring of below-grade water chemistry, including	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
					consideration of potential seasonal variations.For plants with aggressive groundwater/soil, and/or where the concrete structural elements have experienced degradation, a plant specific AMP accounting for the extent of the degradation experienced should be implemented to manage the concrete aging during the period of extended operation.							
C-28	Concrete:Basemat	Concrete	Air - outdoor	Loss of material (spalling, scaling) and cracking/ freeze-thaw	Chapter XI.S2, "ASME Section XI, Subsection IWL"Accessible areas:Inspections performed in accordance with IWL will indicate the presence of loss of material (spalling, scaling) and surface cracking due to freeze-thaw.Inaccessible Areas:Evaluation is needed for plants that are located in moderate to severe weathering conditions (weathering index >100 day-inch/yr) (NUREG-1557). Documented evidence confirms that where the existing concrete had air content of 3% to 6%, subsequent inspection did not exhibit degradation related to freeze-thaw.	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
					Such inspections should be considered a part of the evaluation.The weathering index for the continental US is shown in ASTM C33-90, Fig. 1.							
C-29	Concrete:Dome; wall; basemat	Concrete	Air - outdoor	Loss of material (spalling, scaling) and cracking/ freeze-thaw	Chapter XI.S2, "ASME Section XI, Subsection IWL"Accessible areas:Inspections performed in accordance with IWL will indicate the presence of loss of material (spalling, scaling) and surface cracking due to freeze-thaw.Inaccessible Areas:Evaluation is needed for plants that are located in moderate to severe weathering conditions (weathering index >100 day-inch/yr) (NUREG-1557). Documented evidence confirms that where the existing concrete had air content of 3% to 6%, subsequent inspection did not exhibit degradation related to freeze-thaw. Such inspections should be considered a part of the evaluation.The weathering index for the continental US is shown in ASTM C33-90, Fig. 1.	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-30	Concrete:Basemat	Concrete	Water - flowing	Increase in porosity, permeability/ leaching of calcium hydroxide	Chapter XI.S2, "ASME Section XI, Subsection IWL"Accessible areas:Inspections performed in accordance with IWL will indicate the presence of increase in porosity, and permeability due to leaching of calcium hydroxide.Inaccessible Areas: An aging management program is not necessary, even if reinforced concrete is exposed to flowing water, if there is documented evidence that confirms the in-place concrete was constructed in accordance with the recommendations in ACI 201.2R.	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.
C-31	Concrete:Containment; wall; basemat	Concrete	Water - flowing	Increase in porosity, permeability/ leaching of calcium hydroxide	Chapter XI.S2, "ASME Section XI, Subsection IWL"Accessible areas:Inspections performed in accordance with IWL will indicate the presence of increase in porosity, and permeability due to leaching of calcium hydroxide.Inaccessible Areas:An aging *management program* is not necessary, even if reinforced concrete is exposed to flowing water, if there is *documented evidence* that confirms the in-place concrete was constructed in accordance with the *recommendations in* ACI 201.2R-77.	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-32	Concrete:Dome; wall; basemat	Concrete	Water - flowing	Increase in porosity, permeability/ leaching of calcium hydroxide	Chapter XI.S2, "ASME Section XI, Subsection IWL"Accessible areas:Inspections performed in accordance with IWL will indicate the presence of increase in porosity, and permeability due to leaching of calcium hydroxide.Inaccessible Areas:An aging management program is not necessary, even if reinforced concrete is exposed to flowing water, if there is documented evidence that confirms the in-place concrete was constructed in accordance with the recommendations in ACI 201.2R-77.	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-33	Concrete:Dome; wall; basemat	Concrete	Air - indoor uncontrolled or air outdoor	Reduction of strength and modulus/ elevated temperature (>150°F general; >200°F local)	Plant-specific aging management programThe implementation of 10 CFR 50.55a and ASME Section XI, Subsection IWL would not be able to identify the reduction of strength and modulus due to elevated temperature. Thus, for any portions of concrete containment that exceed specified temperature limits, further evaluations are warranted. Subsection CC-3400 of ASME Section III, Division 2, specifies the concrete temperature limits for normal operation or any other long-term period. The temperatures shall not exceed 150°F except for local areas, such as around penetrations, which are not allowed to exceed 200°F.	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.
					If significant equipment loads are supported by concrete at temperatures exceeding 150°F, an evaluation of the ability to withstand the postulated design loads is to be made.Higher temperatures than given above may be allowed in the concrete if tests and/or calculations are provided to evaluate the reduction in strength and this reduction is applied to the design allowables.							

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-34	Concrete:Basemat	Concrete	Air - indoor uncontrolled or air outdoor	Reduction of strength and modulus/ elevated temperature (>150°F general; >200°F local)	Plant-specific aging management programThe implementation of 10 CFR 50.55a and ASME Section XI, Subsection IWL would not be able to identify the reduction of strength and modulus due to elevated temperature. Thus, for any portions of concrete containment that exceed specified temperature limits, further evaluations are warranted. Subsection CC-3400 of ASME Section III, Division 2, specifies the concrete temperature limits for normal operation or any other long-term period. The temperatures shall not exceed 150°F except for local areas, such as around penetrations, which are not allowed to exceed 200°F.	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.
					If significant equipment loads are supported by concrete at temperatures exceeding 150°F, an evaluation of the ability to withstand the postulated design loads is to be made.Higher temperatures than given above may be allowed in the concrete if tests and/or calculations are provided to evaluate the reduction in strength and this reduction is applied to the design allowables.							

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-35	Concrete:Containment; wall; basemat	Concrete	Air - indoor uncontrolled or air outdoor	Reduction of strength and modulus/ elevated temperature (>150°F general; >200°F local)	Plant-specific aging management programThe implementation of 10 CFR 50.55a and ASME Section XI, Subsection IWL would not be able to identify the reduction of strength and modulus due to elevated temperature. Thus, for any portions of concrete containment that exceed specified temperature limits, further evaluations are warranted. Subsection CC-3400 of ASME *Section III, Division 2*, specifies the concrete temperature limits for normal operation or any other long-term period. The temperatures shall not exceed 150°F except for local areas, such as around penetrations, which are not allowed to exceed 200°F.	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.
					If significant equipment loads are supported by concrete at temperatures exceeding 150°F, an evaluation of the ability to withstand the postulated design loads is to be made.Higher temperatures than given above may be allowed in the concrete if tests and/or calculations are provided to evaluate the reduction in strength and this reduction is applied to the design allowables.							

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-36	Concrete:Basemat	Concrete	Soil	Cracks and distortion due to increased stress levels from settlement	Chapter XI.S6, "Structures Monitoring Program"if a de-watering system is relied upon for control of settlement, then the licensee is to ensure proper functioning of the de-watering system through the period of extended operation.	N/A	N/A	N/A	N/A	N/A	N/A	This item is for PWR steel containments or BWR Mk II concrete containment - not applicable to Oyster Creek. The Oyster Creek LRA uses line item T-08 for analogous containment components.
C-37	Concrete:Dome; wall; basemat; ring girders; buttresses	Concrete	Soil	Cracks and distortion due to increased stress levels from settlement	Chapter XI.S6, "Structures Monitoring Program"if a de-watering system is relied upon for control of settlement, then the licensee is to ensure proper functioning of the de-watering system through the period of extended operation.	N/A	N/A	N/A	N/A	N/A	N/A	This item is for PWR concrete containments - not applicable to Oyster Creek.

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-38	Concrete:Basemat	Concrete	Any	Cracking due to expansion/ reaction with aggregates	Chapter XI.S2, "ASME Section XI, Subsection IWL".Accessible Areas:Inspections performed in accordance with IWL will indicate the presence of surface cracking due to reaction with aggregates.Inaccessible Areas:As described in NUREG-1557, investigations, tests, and petrographic examinations of aggregates performed in accordance with ASTM C295-54 or ASTM C227-50 can demonstrate that those aggregates do not react within reinforced concrete. For potentially reactive aggregates, aggregate-reinforced concrete reaction is not significant if the concrete was constructed in accordance with ACI 201.2R.Therefore, if these conditions are satisfied, aging management is not necessary.	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-39	Concrete:Containment; wall; basemat	Concrete	Any	Cracking due to expansion/ reaction with aggregates	Chapter XI.S2, "ASME Section XI, Subsection IWL"Accessible Areas:Inspections performed in accordance with IWL will indicate the presence of surface cracking due to reaction with aggregates.Inaccessible Areas:As described in NUREG-1557, investigations, tests, and petrographic examinations of aggregates performed in accordance with ASTM C295-54 or ASTM C227-50 can demonstrate that those aggregates do not react within reinforced concrete. For potentially reactive aggregates, aggregate-reinforced concrete reaction is not significant if the concrete was constructed in accordance with ACI 201.2R. Therefore, if these conditions are satisfied, aging management is not necessary.	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-40	Concrete:Dome; wall; basemat	Concrete	Any	Cracking due to expansion/ reaction with aggregates	Chapter XI.S2, "ASME Section XI, Subsection IWL"Accessible Areas:Inspections performed in accordance with IWL *will indicate the* presence of surface cracking due to reaction with aggregates.Inaccessible Areas:As described in NUREG-1557, investigations, tests, and petrographic examinations of aggregates performed in accordance with ASTM C295-54 or ASTM C227-50 can demonstrate that those aggregates do not react within reinforced concrete. For potentially reactive aggregates, aggregate-*reinforced concrete* reaction is not significant if the concrete was constructed in accordance with ACI 201.2R.Therefore, if these conditions are satisfied, aging management is not necessary.	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-41	Concrete:Basemat; reinforcing steel	Concrete; steel	Air - indoor uncontrolled or air outdoor	Cracking, loss of bond, and loss of material (spalling, scaling)/ corrosion of embedded steel	Chapter XI.S2, "ASME Section XI, Subsection IWL."Accessible Areas:Inspections performed in accordance with IWL will indicate the presence of surface cracking, loss of bond, and loss of material (spalling, scaling) due to corrosion of embedded steel.Inaccessible Areas:For plants with non-aggressive ground water/soil; i.e., pH > 5.5, chlorides < 500 ppm, or sulfates <1500 ppm, as a minimum, consider (1) Examination of the exposed portions of the below grade concrete, when excavated for any reason, and(2) Periodic monitoring of below-grade water chemistry, including consideration of	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.
					potential seasonal variations.For plants with aggressive groundwater/soil, and/or where the concrete structural elements have experienced degradation, a plant specific AMP accounting for the extent of the degradation experienced should be implemented to manage the concrete aging during the period of extended operation.							

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-42	Concrete:Dome; wall; basemat; reinforcing steel	Concrete; steel	Air - indoor uncontrolled or air - outdoor	Cracking, loss of bond, and loss of material (spalling, scaling)/ corrosion of embedded steel	Chapter XI.S2, "ASME Section XI, Subsection IWL"Accessible Areas:Inspections performed in accordance with IWL will indicate the presence of surface cracking, loss of bond, and loss of material (spalling, scaling) due to corrosion of embedded steel.Inaccessible Areas:For plants with non-aggressive ground water/soil; i.e., pH > 5.5, chlorides < 500 ppm, or sulfates <1500 ppm, as a minimum, consider (1) Examination of the exposed portions of the below grade concrete, when excavated for any reason, and(2) Periodic monitoring of below-grade water chemistry, including consideration of	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.
					potential seasonal variations.For plants with aggressive groundwater/soil, and/or where the concrete structural elements have experienced degradation, a plant specific AMP accounting for the extent of the degradation experienced should be implemented to manage the concrete aging during the period of extended operation.							

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-43	Concrete:Basemat; reinforcing steel	Concrete; steel	Air - indoor uncontrolled or air - outdoor	Cracking, loss of bond, and loss of material (spalling, scaling)/ corrosion of embedded steel	Chapter XI.S2, "ASME Section XI, Subsection IWL".Accessible Areas:Inspections performed in accordance with IWL will indicate the presence of surface cracking, loss of bond, and loss of material (spalling, scaling) due to corrosion of embedded steel.Inaccessible Areas:For plants with non-aggressive ground water/soil; i.e., pH > 5.5, chlorides < 500 ppm, or sulfates <1500 ppm, as a minimum, consider (1) Examination of the exposed portions of the below grade concrete, when excavated for any reason, and(2) Periodic monitoring of below-grade water chemistry, including consideration of	N/A	N/A	N/A	N/A	N/A	N/A	Concrete containment - not applicable to Oyster Creek.
					potential seasonal variations.For plants with aggressive groundwater/soil, and/or where the concrete structural elements have experienced degradation, a plant specific AMP accounting for the extent of the degradation experienced should be implemented to manage the concrete aging during the period of extended operation.							

September 2005 Revision 1						Oyster Creek LRA						
Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-44	Suppression pool shell; unbraced downcomers	Steel; stainless steel; dissimilar metal welds	Air - indoor uncontrolled	Cracking/ cyclic loading(CLB fatigue analysis does not exist)	Chapter XI.S1, "ASME Section XI, Subsection IWE" and Chapter XI.S4, "10 CFR Part 50, Appendix J"Evaluation of 10 CFR 50.55a/ASME Section XI, Subsection IWE is to be supplemented to consider the following:(4) Detection of Aging Effects: VT-3 visual inspection may not detect fine cracks.	N/A	N/A	N/A	N/A	N/A	N/A	Oyster Creek has a CLB fatigue analysis - this line item is not applicable to Oyster Creek.
C-45	Suppression pool shell; unbraced downcomers	Steel; stainless steel; dissimilar metal welds	Air - indoor uncontrolled	Cumulative fatigue damage/ fatigue(Only if CLB fatigue analysis exists)	Fatigue is a time-limited aging analysis (TLAA) to be evaluated for the period of extended operation. See the Standard Review Plan, Section 4.6, "Containment Liner Plate and Penetration Fatigue Analysis" for acceptable methods for meeting the requirements of 10 CFR 54.21(c)(1).	C-13 (supp. pool shell penetrations)	Steel elements:vent header, drywell head, torus, downcomers,pool shell	Steel	Air - indoor uncontrolled	Cumulative fatigue damage	TLAA evaluated in accordance with 10 CFR 54.21(c)	Oyster Creek has braced downcomers. Oyster Creek has a CLB fatigue analysis. Penetrations in the suppression pool shell are evaluated with line item C-13 in the Oyster Creek LRA.

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-46	Steel elements: Suppression chamber; drywell liner; drywell head; embedded shell; sand pocket region; support skirt; downcomer *pipes; region shielded by* diaphragm floor (as applicable)NOTE: Inspection of containment supports is addressed by ASME Section XI, Subsection IWF (see III.B1.3)	Steel	Air - indoor uncontrolled or treated water	Loss of material/ general, pitting, and crevice corrosion	Chapter XI.S1, "ASME Section XI, Subsection IWE"For inaccessible areas (embedded containment steel shell or liner), loss of *material due to* corrosion is not significant if the following conditions are satisfied:Concrete meeting the specifications of ACI 318 or 349 and the guidance of 201.2R was used for the containment concrete in contact with the embedded containment shell or liner. The concrete is monitored to ensure that it is free of penetrating cracks that provide a path for water seepage to the *surface of the* containment shell or liner. The moisture barrier, at the junction where the shell or liner	C-19	Steel elements: liner plate, containment shell downcomers, drywell support skirt, ECCS *suction header*	Steel	Air - indoor uncontrolled	Loss of material due to general, pitting and crevice *corrosion in* accessible and inaccessible areas	ASME Section XI, Subsection IWE, B.1.27, and 10 CFR Part 50, Appendix J, B.1.29	The Oyster Creek LRA evaluated analogous items with C-19.
					becomes embedded, is subject to aging management activities in accordance with ASME Section XI, Subsection IWE requirements. Water *ponding on the* containment concrete floor are not common and when detected are cleaned up in a timely manner.If any of the above conditions cannot be satisfied, then a plant-specific aging management program for corrosion is necessary.Chapter XI.S4, "10 CFR Part 50, Appendix J"							

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-47	Steel elements:Vent header;Downcomers	Stainless steel; steel	Air - indoor uncontrolled	Cracking/ cyclic loading(CLB fatigue analysis does not exist)	Chapter XI.S1, "ASME Section XI, Subsection IWE" and Chapter XI.S4, "10 CFR Part 50, Appendix J"Evaluation of 10 CFR 50.55a/ASME Section XI, Subsection IWE is augmented as follows:(4) Detection of Aging Effects: VT-3 visual inspection may not detect fine cracks.	N/A	N/A	N/A	N/A	N/A	N/A	Oyster Creek has a CLB fatigue analysis - this line item is not applicable to Oyster Creek.
C-48	Steel elements:Vent header;Downcomers	Stainless steel; steel	Air - indoor uncontrolled or treated water	Cumulative fatigue damage/ fatigue(Only if CLB fatigue analysis exists)	Fatigue is a time-limited aging analysis (TLAA) to be evaluated for the period of extended operation. See the Standard Review Plan, Section 4.6, "Containment Liner Plate and Penetration Fatigue Analysis" for acceptable methods for meeting the requirements of 10 CFR 54.21(c)(1).	N/A	N/A	N/A	N/A	N/A	N/A	This item is for a Mark II containment and not applicable to Oyster Creek. The Oyster Creek LRA evaluated analogous items with C-21.
C-49	Steel elements:Suppression chamber liner (interior surface)	Stainless steel; steel	Air - indoor uncontrolled or treated water	Loss of material/ general, pitting, and crevice corrosion	Chapter XI.S1, "ASME Section XI, Subsection IWE" and Chapter XI.S4, "10 CFR Part 50, Appendix J"	N/A	N/A	N/A	N/A	N/A	N/A	This is applicable to a concrete containment with a steel liner - not applicable to Oyster Creek.

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-50	Concrete:Basemat, concrete fill-in annulus	Concrete	Air - indoor uncontrolled or air outdoor	Reduction of strength and modulus/ elevated temperature (>150°F general; >200°F local)	Plant-specific aging management programThe implementation of 10 CFR 50.55a and ASME Section XI, Subsection IWL would not be able to identify the reduction of strength and modulus due to elevated temperature. Thus, for any portions of concrete containment that exceed specified temperature limits, further evaluations are warranted. Subsection CC-3400 of ASME Section III, Division 2, specifies the concrete temperature limits for normal operation or any other long-term period. The temperatures shall not exceed 150°F except for local areas, such as around penetrations, which are not allowed to exceed 200°F.	N/A	N/A	N/A	N/A	N/A	N/A	This is applicable to a Mk.III concrete containment - not applicable to Oyster Creek.
					If significant equipment loads are supported by concrete at temperatures exceeding 150°F, an evaluation of the ability to withstand the postulated design loads is to be made.Higher temperatures than given above may be allowed in the concrete if tests and/or calculations are provided to evaluate the reduction in strength and this reduction is applied to the design allowables.							

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
C-51	Concrete:Basemat, *concrete fill-in annulus*	Concrete	Any	Cracking due to expansion/ reaction with aggregates	Chapter XI.S2, "ASME Section XI, Subsection IWL"Accessible Areas:Inspections performed in accordance with IWL will indicate the presence of surface cracking due to reaction with aggregates.Inaccessible Areas:As described in NUREG-1557, investigations, tests, and petrographic examinations of aggregates performed *in accordance with* ASTM C295-54 or ASTM C227-50 can demonstrate that those aggregates do not react within reinforced concrete. For potentially reactive aggregates, aggregate-reinforced concrete reaction is not significant if the concrete was constructed in accordance with ACI 201.2R.*Therefore, if* these conditions are satisfied, aging management is not necessary.	N/A	N/A	N/A	N/A	N/A	N/A	This is applicable to a Mk.III concrete containment - not applicable to Oyster Creek.
EP-39	Heat exchanger tubes	Copper alloy	Closed cycle cooling water	Reduction of heat transfer/ fouling	Chapter XI.M21, "Closed-Cycle Cooling Water System"	N/A	N/A	N/A	N/A	N/A	N/A	The material and enviroment combination of copper alloy and CCCW is not applicable to Oyster Creek ESF systems. Reduction of heat transfer in copper alloy heat exchanger tubes is managed by the CCCW program in non-ESF systems in the OC LRA.

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
EP-40	Heat exchanger tubes	Steel	Lubricating oil	Reduction of heat transfer/ fouling	Chapter XI.M39, "Lubricating Oil Analysis"The AMP is to be augmented by verifying the effectiveness of the lubricating oil analysis program. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.	N/A	N/A	N/A	N/A	N/A	N/A	The material and environment combination of steel heat exchanger tubes in lubricating oil is not applicable to Oyster Creek ESF systems. The Lubricating Oil Monitoring Activities program is used to manage reduction of heat transfer in heat exchanger tubes in lubricating oil in non-ESF systems in the OC LRA.
EP-41	Piping, piping components, piping elements, and tanks	Stainless steel	Treated borated water	Loss of material/ pitting and crevice corrosion	Chapter XI.M2, "Water Chemistry," for PWR primary water	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWRs only.
EP-42	Encapsulation Components	Steel	Air - indoor uncontrolled (Internal)	Loss of material/ general, pitting, and crevice corrosion	Chapter XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components"	N/A	N/A	N/A	N/A	N/A	N/A	This component is not applicable to Oyster Creek ESF systems and is not included in the LRA.
EP-43	Encapsulation Components	Steel	Air with borated water leakage (Internal)	Loss of material/ general, pitting, crevice and boric acid corrosion	Chapter XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components"	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWRs only.
EP-44	Piping, piping components, and piping elements	Stainless steel	Closed cycle cooling water >60°C (>140°F)	Cracking/ stress corrosion cracking	Chapter XI.M21, "Closed-Cycle Cooling Water System"	N/A	N/A	N/A	N/A	N/A	N/A	There is no Closed Cycle Cooling Water greater than 140 degrees F environment at Oyster Creek; this item is not applicable to the OC LRA.
EP-45	Piping, piping components, and piping elements	Copper alloy	Lubricating oil	Loss of material/ pitting and crevice corrosion	Chapter XI.M39, "Lubricating Oil Analysis"The AMP is to be augmented by verifying the effectiveness of the lubricating oil analysis program. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.	N/A	N/A	N/A	N/A	N/A	N/A	The material and environment combination of copper alloy and lubricating oil is not applicable to ESF systems at Oyster Creek, therefore this item is not applicable to the OC LRA. Non-ESF systems at Oyster creek address loss of material in copper alloy material with a lubricating oil environment with line item AP-47 using Lubricating Oil Monitoring Activities and One-Time Inspection programs.

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
EP-46	Piping, piping components, and piping elements	Steel	Lubricating oil	Loss of material/ general, pitting, and crevice corrosion	Chapter XI.M39, "Lubricating Oil Analysis"The AMP is to be augmented by verifying the effectiveness of the lubricating oil analysis program. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.	N/A	N/A	N/A	N/A	N/A	N/A	The material and environment combination of steel and lubricating oil is not applicable to ESF systems at Oyster Creek, therefore this item is not applicable to the OC LRA. Non-ESF systems at Oyster creek address loss of material in steel material with a lubricating oil environment with line items AP-30 and SP-25 using Lubricating Oil Monitoring Activities and One-Time Inspection programs.
EP-47	Heat exchanger tubes	Copper alloy	Lubricating oil	Reduction of heat transfer/ fouling	Chapter XI.M39, "Lubricating Oil Analysis"The AMP is to be augmented by verifying the effectiveness of the lubricating oil analysis program. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.	N/A	N/A	N/A	N/A	N/A	N/A	The material and enviroment combination of copper alloy heat exchanger tubes in lubricating oil is not applicable to Oyster Creek ESF systems. The Lubricating Oil Monitoring Activities program is used to manage reduction of heat transfer in heat exchanger tubes in lubricating oil in non-ESF systems in the OC LRA.
EP-48	Piping, piping components, and piping elements	Steel	Closed cycle cooling water	Loss of material/ general, pitting, and crevice corrosion	Chapter XI.M21, "Closed-Cycle Cooling Water System"	N/A	N/A	N/A	N/A	N/A	N/A	The material and enviroment combination of steel piping, piping components, and piping elements in closed cycle cooling water is not applicable to Oyster Creek ESF systems. The Closed Cycle Cooling Water program is used to manage loss of material in steel piping with items A-25 and A-63 in non-ESF systems in the OC LRA.
EP-49	Pump Casings	Steel with stainless steel cladding	Treated borated water	Loss of material/ cladding breach	A plant-specific aging management program is to be evaluated.Reference NRC Information Notice 94-63, "Boric Acid Corrosion of Charging Pump Casings Caused by Cladding Cracks."	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWRs only.

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
EP-50	Heat exchanger tubes	Stainless steel	Lubricating oil	Reduction of heat transfer/ fouling	Chapter XI.M39, "Lubricating Oil Analysis"The AMP is to be augmented by verifying the effectiveness of the lubricating oil analysis program. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.	N/A	N/A	N/A	N/A	N/A	N/A	The material and enviroment combination of stainless steel heat exchanger tubes in lubricating oil is not applicable to Oyster Creek systems.
EP-51	Piping, piping components, and piping elements	Stainless steel	Lubricating oil	Loss of material/ pitting and crevice corrosion	Chapter XI.M39, "Lubricating Oil Analysis"The AMP is to be augmented by verifying the effectiveness of the lubricating oil analysis program. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.	N/A	N/A	N/A	N/A	N/A	N/A	The material and environment combination of stainless steel and lubricating oil is not applicable to ESF systems at Oyster Creek, therefore this item is not applicable to the OC LRA. Non-ESF systems at Oyster creek address loss of material in stainless steel material with a lubricating oil environment with line items AP-59 and SP-38 using Lubricating Oil Monitoring Activities and One-Time Inspection programs.
EP-52	Piping, piping components, piping elements	Gray cast iron	Closed cycle cooling water	Loss of material/ selective leaching	Chapter XI.M33, "Selective Leaching of Materials"	N/A	N/A	N/A	N/A	N/A	N/A	The material and environment combination of grey cast iron and closed cooling water is not applicable to ESF systems at Oyster Creek, therefore this item is not applicable to the OC LRA. Non-ESF systems at Oyster creek address loss of material due to selective leaching in cast iron material with a closed cooling water environment with line item A-50 using Selective Leaching of materials program.

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
EP-53	Piping, piping components, piping elements internal surfaces, and tanks	Stainless steel	Condensation (Internal)	Loss of material/ pitting and crevice corrosion	A plant-specific aging management program is to be evaluated.	N/A	N/A	N/A	N/A	N/A	N/A	The material and environment combination of stainless steel and condensation is not applicable to ESF systems at Oyster Creek, therefore this item is not applicable to the OC LRA. Non-ESF systems at Oyster creek address loss of material due to pitting and crevice corrosion in stainless steel material with a condensation environment with line item A-12 using the One-Time Inspection program.
EP-54	Piping, piping components, and piping elements	Gray cast iron	Soil	Loss of material/ selective leaching	Chapter XI.M33, "Selective Leaching of Materials"	N/A	N/A	N/A	N/A	N/A	N/A	The material and environment combination of grey cast iron and soil is not applicable to ESF systems at Oyster Creek, therefore this item is not applicable to the OC LRA. Non-ESF systems at Oyster creek address loss of material due to selective leaching in cast iron material with a soil environment with line item A-02 using Selective Leaching of Materials program,and A-01 using the Buried Piping Inspection program.
EP-55	Piping, piping components, and piping elements	Stainless steel	Raw water	Loss of material/ pitting, crevice, and microbiologically influenced corrosion	Chapter XI.M20, "Open Cycle Cooling Water System"	N/A	N/A	N/A	N/A	N/A	N/A	The material and environment combination of stainless steel and Raw Water (salt water) is not applicable to ESF systems at Oyster Creek, therefore this item is not applicable to the OC LRA. Non-ESF systems at Oyster creek address loss of material due to piting, crevice, and mic corrosion in stainless steel material with a raw water - salt water environment with line item A-54 using the Open-Cycle Cooling Water or Periodic Inspection programs.

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
R-219	Reactor vessel components:Flanges;Nozzles;Penetrations;Pressure housings;Safe ends;Thermal sleeves;Vessel shells, heads and welds	Steel; stainless steel; steel with nickel-alloy or stainless steel cladding; nickel-alloy	Reactor coolant	Cumulative fatigue damage/ fatigue	Fatigue is a time-limited aging analysis (TLAA) to be performed for the period of extended operation, and, for Class 1 components, environmental effects on fatigue are to be addressed. See the Standard Review Plan, Section 4.3 "Metal Fatigue," for acceptable methods for meeting the requirements of 10 CFR 54.21(c)(1).	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWRs only.
R-220	Reactor coolant pressure boundary components:Piping, piping components, and piping elements	Steel; stainless steel; steel with nickel-alloy or stainless steel cladding; nickel-alloy	Reactor coolant	Cumulative fatigue damage/ fatigue	Fatigue is a time-limited aging analysis (TLAA) to be performed for the period of extended operation, and for Class 1 components, environmental effects on fatigue are to be addressed. See the Standard Review Plan, Section 4.3 "Metal Fatigue," for acceptable methods for meeting the requirements of 10 CFR 54.21(c)(1).	R-04	Piping, piping components, and piping elements; flanges; heater sheaths and sleeves; penetrations; pressure housings; pump casing/cover; spray head; thermal sleeves; vessel shell heads and welds	Steel, stainless steel, cast austenitic stainless steel, carbon steel with nickel-alloy or stainless steel cladding, nickel-alloy	Reactor coolant	Cumulative fatigue damage/fatigue	TLAA, evaluated in accordance with 10 CFR 54.21(c) and environmental effects are to be addressed for Class 1 components	This material and environment combination is addressed in Oyster Creek reactor coolant systems with line item R-04.
R-221	Recirculating steam generator components:Flanges; Penetrations; Nozzles;Safe ends, lower heads and welds	Steel; stainless steel; steel with nickel-alloy or stainless steel cladding; nickel-alloy	Reactor coolant	Cumulative fatigue damage/ fatigue	Fatigue is a time-limited aging analysis (TLAA) to be performed for the period of extended operation, and, for Class 1 components, environmental effects on fatigue are to be addressed. See the Standard Review Plan, Section 4.3 "Metal Fatigue," for acceptable methods for meeting the requirements of 10 CFR 54.21(c)(1).	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWRs only.

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
R-222	Once-through steam generator components:Primary side nozzlesSafe ends and welds	Steel; stainless steel; steel with nickel-alloy or stainless steel cladding; nickel-alloy	Reactor coolant	Cumulative fatigue damage/ fatigue	Fatigue is a time-limited aging analysis (TLAA) to be performed for the period of extended operation, and, for Class 1 components, environmental effects on fatigue are to be addressed. See the Standard Review Plan, Section 4.3 "Metal Fatigue," for acceptable methods for meeting the requirements of 10 CFR 54.21(c)(1).	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWRs only.
R-223	Reactor coolant pressure boundary components:Piping, piping components, and piping elements;Flanges;Nozzles and safe ends;Pressurizer vessel shell heads and welds;Heater sheaths and sleeves;Penetrations; andThermal sleeves	Steel; stainless steel; steel with nickel-alloy or stainless steel cladding; nickel-alloy	Reactor coolant	Cumulative fatigue damage/ fatigue	Fatigue is a time-limited aging analysis (TLAA) to be performed for the period of extended operation, and, for Class 1 components, environmental effects on fatigue are to be addressed. See the Standard Review Plan, Section 4.3 "Metal Fatigue," for acceptable methods for meeting the requirements of 10 CFR 54.21(c)(1).	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWRs only.
R-224	Steam generator componentsShell assembly	Steel	Secondary feedwater/ steam	Loss of material/ general, pitting, and crevice corrosion	Chapter XI.M2, "Water Chemistry," for PWR secondary waterThe AMP is to be augmented by verifying the effectiveness of water chemistry control. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWRs only.

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
R-225	Isolation condenser components	Stainless steel; steel	Reactor coolant	Cracking/ cyclic loading	Chapter XI.M1, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD," for Class 1 componentsThe AMP in Chapter XI.M1 is to be augmented to detect cracking due to cyclic loading and verification of the program's effectiveness is necessary to ensure that significant degradation is not occurring and the component intended function will be maintained during the *extended period of* operation. An acceptable verification program is to include temperature and radioactivity monitoring of the shell side water, and	R-15	isolation condenser tube side components	Stainless steel, steel	Reactor coolant	Cracking/ stress corrosion cracking and intergranular *stress* corrosion cracking	Chapter XI.M1, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD," for Class 1 components and Chapter XI.M2, "Water *Chemistry," for* BWR water in BWRVIP-29 (EPRI TR-103515). The AMP in Chapter XI.M1 is to be augmented to detect cracking due to stress corrosion cracking and cyclic Loading or loss of material due to pitting and crevice corrosion, and verification of the effectiveness of the program is necessary to ensure that significant degradation is not *occurring and the* component intended function will be maintained during the extended period of operation. An acceptable verification program is to include temperature and radioactivity monitoring of the shell side water, and eddy current testing of tubes.	The Oyster Creek LRA credits the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program B.1.1 and Water Chemistry program B.1.2 as augmented by GALL for *managing cracks in the isolation* condenser tube side components. Cracks due to cyclic loading are managed in the same manner.
R-226	Tubes	Nickel alloy	Secondary feedwater/ steam	Denting/ corrosion of carbon steel *tube support* plate	Chapter XI.M19, "Steam Generator Tubing Integrity" *andChapter* XI.M2, "Water Chemistry," for PWR secondary water.	N/A	N/A	N/A	N/A	N/A		Applicable to PWRs only.
RP-23	Piping, piping components, and piping elements; flanges; heater sheaths and sleeves; penetrations; thermal sleeves; vessel shell heads and welds	Steel with stainless steel or nickel alloy cladding; stainless steel; nickel alloy	Reactor coolant	Loss of material/ pitting and *crevice* corrosion	Chapter XI.M2, "Water Chemistry," for PWR primary water	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWRs only.
RP-24	Reactor vessel internals components	Stainless steel; nickel alloy	Reactor coolant	Loss of material/ pitting and crevice corrosion	Chapter XI.M2, "Water Chemistry," for PWR primary water	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWRs only.

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
RP-25	Reactor Vessel:Flanges, nozzles; penetrations; safe ends; vessel shells, heads and welds	Stainless steel; steel with nickel-alloy or stainless steel cladding; nickel-alloy	Reactor Coolant	Loss of material/ pitting and crevice corrosion	Chapter XI.M2, "Water Chemistry," for BWR waterThe AMP is to be augmented by verifying the effectiveness of water chemistry control. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.	This new line item was not addressed in the Oyster Creek LRA						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 though 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.
RP-26	Reactor vessel internals components	Stainless steel; nickel alloy	Reactor coolant	Loss of material/ pitting and crevice corrosion	Chapter XI.M1, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD," for Class 1 components and Chapter XI.M2, "Water Chemistry" for BWR water	This new line item was not addressed in the Oyster Creek LRA						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.
RP-27	Reactor coolant pressure boundary components	Steel with stainless steel or nickel alloy cladding; stainless steel; nickel alloy	Reactor coolant	Loss of material/ pitting and crevice corrosion	Chapter XI.M2, "Water Chemistry," for BWR waterThe AMP is to be augmented by verifying the effectiveness of water chemistry control. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.	EP-32 A-58 AP-57	Piping, piping components, and piping elements	Stainless steel	Treated water	Loss of material/ pitting and crevice corrosion	Water Chemistry program (B.1.2) and the One-Time Inspection program (B.1.24) to verify the effectiveness of water chemistry control.	For piping, piping components, and piping elements in RCPB systems and systems with RCPB interface, the Oyster Creek LRA used line items EP-32, A-58, and AP-57 for loss of material due to pitting and crevice corrosion of stainless steel in treated water (including reactor coolant), using the Water Chemistry and One-Time Inspection programs. This is in conformance with the September 2005 Revision 1 of GALL.
RP-28	Flanges; nozzles; penetrations; pressure housings; safe ends; vessel shells, heads and welds	Stainless steel; steel with nickel-alloy or stainless steel cladding; nickel-alloy	Reactor Coolant	Loss of material/ pitting and crevice corrosion	Chapter XI.M2, "Water Chemistry," for PWR primary water	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWRs only.

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
RP-31	Piping, piping components, and piping elements	Nickel alloy	Reactor coolant/ steam	Cracking/ primary water stress corrosion cracking	Chapter XI.M1, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD" for Class 1 components, andChapter XI.M2, "Water Chemistry" for PWR primary water andComply with applicable NRC Orders and provide a commitment in the FSAR supplement to implement applicable (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines.	N/A	N/A	N/A	N/A	N/A	N/A	Applicable to PWRs only.
SP-53	Heat exchanger tubes	Copper alloy	Lubricating oil	Reduction of heat transfer/fouli ng	Chapter XI.M39, "Lubricating Oil Analysis"The AMP is to be augmented by verifying the effectiveness of the lubricating oil analysis program. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.	N/A	Emergency Diesel Generator and Auxiliary System and Fire Protection System heat exchanger tubes	Brass and copper alloy	Lubricating Oil	Reduction of heat transfer	Lubricating Oil Monitoring Activities (B.2.2)	The Lubricating Oil Monitoring Activities (B.2.2) plant specific program provides for monitoring and control of oil impurities and properties to mitigate loss of heat transfer (fouling) in lubricating oil systems by preserving an environment that is not conducive to heat transfer aging effects. It does not include verification by one-time inspection.
SP-54	Piping, piping components, and piping elements	Stainless steel	Closed cycle cooling water >60°C (>140°F)	Cracking/stre ss corrosion cracking	Chapter XI.M21, "Closed-Cycle Cooling Water System"	N/A	N/A	N/A	N/A	N/A	N/A	There is no stainless steel exposed to a closed cooling water environment > 140 deg F.
SP-55	Piping, piping components, and piping elements	Copper alloy >15% Zn	Treated water	Loss of material/ selective leaching	Chapter XI.M33, "Selective Leaching of Materials"	AP-32	Valve bodies and heat exchanger tube sheets	Brass, bronze, copper alloy, aluminum bronze	Treated water	Loss of material	Selective Leaching of Materials (B.1.25)	None.
SP-56	Heat exchanger tubes	Copper alloy	Raw water	Reduction of heat transfer/fouli ng	Chapter XI.M20, "Open Cycle Cooling Water System"	N/A	N/A	N/A	N/A	N/A	N/A	There are no copper alloy components exposed to a raw water - salt water environment with a heat transfer intended function.

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Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Item	Structure and/or Component	Material	Environment	Aging Effect	Aging Management Program	Comments
SP-57	Heat exchanger tubes	Copper alloy	Closed cycle cooling water	Reduction of heat transfer/fouling	Chapter XI.M21, "Closed-Cycle Cooling Water System"	N/A	N/A	N/A	N/A	N/A	N/A	The material and environment combination of copper alloy heat exchanger tubes in closed cycle cooling water is not applicable to Oyster Creek Steam and Power Conversion Systems. For applications of this material and environment combination in Auxiliary Systems, see new GALL item AP-80.
SP-58	Heat exchanger tubes	Copper alloy	Treated water	Reduction of heat transfer/fouling	Chapter XI.M2, "Water Chemistry"The AMP is to be augmented by verifying the effectiveness of water chemistry control. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.	N/A	Shutdown Cooling Pumps seal coolers (RBCCW LR System)	Copper	Treated water	Reduction of Heat Transfer	Water Chemistry (B.1.2)	Does not include verification via one-time inspection. The treated water environment for the SDC pumps seal coolers is reactor coolant. The Water Chemistry program requirements for reactor quality water provide added assurance that an environment conducive to fouling does not exist.
SP-59	Piping, piping components, and piping elements	Steel	Air - outdoor (Internal)	Loss of material/ general, pitting, and crevice corrosion	Chapter XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components"	N/A	N/A	N/A	N/A	N/A	N/A	There are no steel piping, piping components, and piping elements exposed to an air - outdoor (Internal) environment. Ventilation components would typically fall in this category. For the Oyster Creek LRA, the internal environment was considered air - indoor as soon as it gets into the system.
SP-60	Piping, piping components, and piping elements	Steel	Condensation (Internal)	Loss of material/ general, pitting, and crevice corrosion	Chapter XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components"	A-13	Drain traps, piping and fittings, and valve bodies	Cast iron and carbon steel	Condensation	Loss of Material	Periodic Inspection Program (B.2.5)	The Periodic Inspection Program (B.2.5) provides for planned periodic internal inspections. The inspections provided by XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components" are performed during the periodic system and component surveillances or during the performance of maintenance activities when the surfaces are made accessible for visual inspection. These 2 programs provide equivalent aging managment.

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SP-61	Piping, piping components, and piping elements	Copper alloy	Treated water	Loss of material/ pitting and crevice corrosion	Chapter XI.M2, "Water Chemistry"The AMP is to be augmented by verifying the effectiveness of water chemistry control. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.	AP-64 AP-70	Coolers and valves	Aluminum bronze, brass, copper, and copper alloy	Treated water	Loss of material	Water Chemistry (B.1.2) and One-Time Inspection (B.1.24)	AP-64 in the Draft January GALL mistakenly invoked Chapter XI.M21, "Closed-Cycle Cooling Water System" for managing LOM in a treated water environment. AP-70 in the Draft January GALL invoked a "plant-specific" aging management program. The OC LRA used the Water Chemistry and One-Time Inspection aging management programs for both AP-64 and AP-70.
SP-62	Heat exchanger tubes	Stainless steel	Lubricating oil	Reduction of heat transfer/fouling	Chapter XI.M39, "Lubricating Oil Analysis"The AMP is to be augmented by verifying the effectiveness of the lubricating oil analysis program. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.	N/A	N/A	N/A	N/A	N/A	N/A	There are no stainless steel heat exchanger components exposed to a lubricating oil environment with a heat transfer intended function.
SP-63	Heat exchanger tubes	Steel	Lubricating oil	Reduction of heat transfer/fouling	Chapter XI.M39, "Lubricating Oil Analysis"The AMP is to be augmented by verifying the effectiveness of the lubricating oil analysis program. See Chapter XI.M32, "One-Time Inspection," for an acceptable verification program.	N/A	Shutdown Cooling Pumps bearing housing coolers (RBCCW LR System)	Cast iron	Lubricating oil	Reduction of heat transfer	Lubricating Oil Monitoring Activities (B.2.2)	The Lubricating Oil Monitoring Activities (B.2.2) plant specific program provides for monitoring and control of oil impurities and properties to mitigate loss of heat transfer (fouling) in lubricating oil systems by preserving an environment that is not conducive to heat transfer aging effects. It does not include verification by one-time inspection.
SP-64	Heat exchanger tubes	Steel	Closed cycle cooling water	Reduction of heat transfer/fouling	Chapter XI.M21, "Closed-Cycle Cooling Water System"	N/A	Fuel Pool Cooling heat exchangers and Shutdown Cooling Pumps bearing housing coolers (RBCCW LR System)	Carbon steel and cast iron	Closed Cooling Water	Reduction of heat transfer	Closed-Cycle Cooling Water System (B.1.14)	None.

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T-32	Sliding surfaces	Lubrite®	Air - indoor uncontrolled or air - outdoor	Loss of mechanical function/ corrosion, distortion, dirt, overload, fatigue due to vibratory and cyclic thermal loads	Chapter XI.S3, "ASME Section XI, Subsection IWF"	T-28	Supports for ASME Class MC Components (guides, stops, sliding surfaces, design clearances)	Lubrite	Indoor Air	Loss of Mechanical Function	ASME Section XI, Subsection IWF (B.1.28)	None.
T-33	Vibration isolation elements	Non-metallic (e.g., Rubber)	Air - indoor uncontrolled or air - outdoor	Reduction or loss of isolation function/ radiation hardening, temperature, humidity, sustained vibratory loading	Chapter XI.S3, "ASME Section XI, Subsection IWF"	T-31	Supports for HVAC Components (vibration isolation elements)	Elastomer	Indoor air and outdoor air	Reduction or Loss of Isolation Function	Structures Monitoring Program (B.1.31)	The requirements in T-31 are unchanged from the January draft to the final September GALL version. T-31 in the Final September version of the GALL is identical to T-33 with the exception that T-31 invokes the Structures Monitoring Program. The Oyster Creek LRA is in accordance with T-31 for this material, environment, and aging effect combination.
TP-10	Support members; welds; bolted connections; support anchorage to building structure	Stainless steel; steel	Treated Water < 60C (<140 F)	Loss of material/ general, pitting, and crevice corrosion	Chapter XI.M2, "Water Chemistry," for BWR water, andChapter XI.S3, "ASME Section XI, Subsection IWF"	A-35, A-58	Supports for ASME Class 2 and 3 Piping and Components (support members, welds, bolted connections, support anchorage to building structure) and Supports for ASME Class MC Components (support members, welds, bolted connections, support anchorage to building structure)	Carbon steel and stainless steel	Treated Water < 140F	Loss of material	Water Chemistry (B.1.2) and ASME Section XI, Subsection IWF (B.1.28)	Both A-35 and A-58 invoke the Water Chemistry program and a verification program such as One-Time Inspection. The Oyster Creek LRA used the ASME Section XI, Subsection IWF program for verification. This aligns with TP-10 of the final GALL.

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TP-11	Support members; welds; bolted connections; support anchorage to building structure	Galvanized steel	Air - indoor uncontrolled	None	None	T-26, TP-8	Supports for ASME Class 1 Piping and Components (support members, welds, bolted connections, support anchorage to building structure), Supports for Cable Trays (support members, welds, bolted connections, support anchorage to building structure), Supports for conduits (support members, welds, bolted connections, support anchorage to building structure), Supports for HVAC Components, and Other	Galvanized Steel	Indoor Air	None	None	T-26 identifies an aging effect of cumulative fatigue damage. TP-8 identifies an aging effect of loss of material. Both of these aging effects were determined to not be applicable to Oyster Creek. See plant specific notes 2 and 4 of the Component Supports Commodity Group AMR.

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							Miscellaneous Mechanical Equipment (support members, welds, bolted connections, support anchorage to building structure), Supports for HVAC ducts (support members, welds, bolted connections, support anchorage to building structure), Supports for Masonry Walls (support members, welds, bolted connections, support anchorage to building structure), Supports for Non-ASME Piping and Components (support					

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							members, welds, bolted connections, support anchorage to building structure), Supports for Panels and Enclosures, Racks (support members, welds, bolted connections, support anchorage to building structure), and Supports for Tube Track and Instrument Tubing (support Members, Welds, Bolted Connections, support anchorage to building structure)					
TP-9	High strength bolting for NSSS component supports	Low alloy steel, yield strength >150 ksi	Air - indoor uncontrolled	Loss of material/ general corrosion	Chapter XI.M18, "Bolting Integrity"	N/A	N/A	N/A	N/A	N/A	N/A	Oyster Creek does not utilize high strength bolting for NSSS component supports.