From: <George.Beck@exeloncorp.com>
To: <dja1@nrc.gov>
Date: 02/27/2006 3:58:27 PM
Subject: OC Q & A Database

Donnie,

Attached is the "Q & A Database" from the Oyster Creek License Renewal Application Aging Management Program and Aging Management Review audits as of 2/27/06. As discussed, this version contains responses to all but 11 questions, which are currently in progress.

If you have any questions, please call.

George Beck
610-765-5631

OC RAI NRC Response 022706
<<OC RAI NRC Response 022706.pdf>>

CC: <VMR1@nrc.gov>, <john.hufnagel@exeloncorp.com>, <fred.polaski@exeloncorp.com>, <donald.warfel@exeloncorp.com>

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Created By: George.Beck@exeloncorp.com

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VMR1 CC (Veronica Rodriguez)

nrc.gov
OWGWPO01.HQGWDO01
DJA1 (D. Ashley)

exeloncorp.com
donald.warfel CC
fred.polaski CC
john.hufnagel CC

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NRC Information Request Form

Item No
AMP-001

Date Received: 9/21/2005

Source AMP Audit

Topic:
Containment Structural Integrity

Status: Closed

Document References:

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

To assist the staff in conducting this review in an efficient manner, the applicant is requested to compile and present the following detailed information:(A) Past Activities (1) Identification of all locations (including the wetwell, if applicable) where wall thickness reduction was originally discovered.(2) The nominal design thickness and the initial measured remaining wall thickness / % wall loss for each location.(3) The results of the root-cause analysis for each location.(4) The remedial action taken to arrest corrosion for each location.(5) Inspections performed at that time to ensure that the full extent of wall loss had been identified.(6) The technical basis for concluding that the degraded OC Mark I containment still meets its licensing basis, including any re-calculation of minimum required wall thickness for all regions of the drywell (and wetwell, if applicable).(7) For each location, the chronology and quantitative results of all subsequent measurements of remaining wall thickness after remedial action was taken. Include an assessment of observed trends.(8) The chronology and quantitative results of inspections performed to ensure that wall loss is not occurring at locations other than those originally identified. (B) Current Activities (thru end of current license term) (9) The inspection and maintenance programs that are currently relied upon to ensure the structural integrity of the OC containment. Include a description of the specific activities performed (inspection locations, inspection methods, evaluation methods, acceptance criteria) and the inspection/maintenance schedule. (C) Future Activities (20 year license renewal period) (10) The inspection and maintenance programs that will be relied upon during the 20 year license renewal period to ensure the structural integrity of the OC containment. Include a description of the specific activities performed (inspection locations, inspection methods, evaluation methods, acceptance criteria) and the inspection/maintenance schedule.(11) The correlation between (10) above and specific Aging Management Programs (AMPs) that are credited in the OC License Renewal Application.(12) A description of any enhancements to or relaxations of the current inspection and maintenance programs (9) that will be incorporated in the future inspection and maintenance programs (10).

Assigned To: Ouaou, Ahmed

Response:

Drywell corrosion is described in detail in LRA Section 3.5, pages 3.5-18 through 3.5-21. As noted in

NRC Information Request Form

this section, the potential for drywell corrosion was recognized in 1980. Since then corrective actions were taken to arrest or mitigate accelerated corrosion and establish a monitoring program designed to provide reasonable assurance that the drywell perform its intended function during the current term. The NRC Staff reviewed the corrective actions and approved the program. The same program will be implemented during the period of extended operation.

AmerGen is committed to supporting the staff in conducting its efficient review. To that end, we have copied selected key CLB documents for the staff review and additional specific documents or information will be provided upon request.

1-26-06 Update

Based on the teleconference held today with Mr. Hans Ashar of NRC Headquarters (NRR) to discuss his draft Requests for Additional Information related to Drywell corrosion, the NRC AMP Audit Team Leader has decided to close this AMP question, deferring to the response that AmerGen will provide as part of the RAI response. Therefore, AMP-001 is being taken to closed with the informatino needed to be provided to the NRC as part of the referenced RAI.

- John G. Hufnagel - 1-26-06

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Hufnagel, John 1/26/2006

Reviewed By: N/A

Approved By: Warfel, Don 1/26/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-002

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
Boraflex Rack Management

Document References:
B.1.15

NRC Representative Davis, Jim

AmerGen (Took Issue): Hufnagel, Joh

Question

LRA AMP B.1.15 Boraflex Rack Management ProgramIn the Exception Section, OCGS stated that:"Blackness test is not performed. The test is replaced with boron areal density measurements using the BADGER device, which gives a better indication of Boraflex effectiveness to perform its intended function."Please provide a reference showing why areal density measurement is equal to or better than Blackness tests.

Assigned To: Ouaou, Ahmed

Response:

Blackness testing only provides information regarding the presence of neutron absorber material. Blackness testing will provide information regarding gaps or missing sections in the Boraflex panel. This information along with surveillance sample coupons are required to indirectly estimate the performance of spent fuel storage rack absorber material.
Areal Density testing using BADGER provides a direct measurement of in-rack performance of Boraflex panels. The Areal Density test measures gaps, erosion and general thinning of the scanned Boraflex panel. The Areal Density test is used to benchmark the RACKLIFE Boraflex performance model. The detail provided by Areal Density testing provides a compelling and comprehensive basis to determine spent fuel storage rack operability and margin to criticality. In summary BLACKNESS testing gives only an indication whether neutron absorber is present or not in a boraflex panel whereas BADGER test provides a quantitative measurement of Boron-10 areal density of neutron absorber in the rack.

Reference: "BADGER, a probe for nondestructive Testing of Residual Boron-10 Absorber Density in Spent -Fuel Racks; Development and Demonstration".
TR-107335, Electric power and Research Institute: Palo Alto, California; October 1997".

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Ouaou, Ahmed	9/28/2005
Reviewed By:	Getz, Stu	10/ 6/2005
Approved By:	Warfel, Don	10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-003		9/21/2005	AMP Audit
Topic:		***Status:***	Closed
Buried Pipe			

Document References:
B.1.26

NRC Representative Davis, Jim

AmerGen (Took Issue): Hufnagel, Joh

Question

LRA AMP B.1.26 Buried Piping InspectionIn the Exception Section, OCGS stated that:"NUREG-1801, Section X1.M.34 Buried Piping and Tanks Inspection AMP only includes buried carbon steel piping, however Oyster Creek has other material in their buried piping program that will be managed as part of this AMP."Questing one: What other materials are included in this AMP.Question two: This statement sounds like an enhancement. Please indicate why it is an exception.

An additional question was raised in the interview on 10/5/05 regarding uncoated buried piping from the 10 Element Section 3 "Parameters Monitored/Inspected". See #3 below for the response.

Assigned To: Rafferty-Czincila, Shannon

Response:

1. Oyster Creek has included Aluminum, Bronze, Cast Iron and Stainless Steel along with Carbon and low alloy steel in the Buried Piping and Tanks Inspection AMP.

2. The OCLR project defines exceptions as elements of the plant specific AMP that are not consistent with the NUREG-1801 AMP descriptions. In this AMP, we conservatively considered this an exception to highlight different material evaluations.

3. In the 10- Element under Section 3 "Parameters Monitored/ Inspected" OC states that "Inspection of buried components identifies coating degradation, if coated, or base metal corrosion, if uncoated. Any evidence of damaged wrapping or coating defects is an indicator of possible corrosion damage to the external surface."

Additionally in Appendix B.1.26 of the LRA an exception is taken as follows:
"NUREG-1801, Section X1.M.34 Buried Piping and Tanks Inspection AMP only includes buried carbon steel piping, however Oyster Creek has other material in their buried piping program that will be managed as part of this AMP. NUREG-1801, Section X1.M.34 Buried Piping and Tanks Inspection AMP relies on preventive measures such as coatings and wrappings, however portions of this piping may not be coated or wrapped. Inspections of buried piping that is not wrapped will inspect for loss of

material due to general pitting, crevice, and microbiologically influenced corrosion."

Currently all of the Carbon Steel underground piping in the scope of license renewal is coated or wrapped. However there are some portions of buried stainless steel and bronze piping that may not be coated or wrapped. This is partially based on line specs that state that there could be fittings in the Service Water system that allow for SS or Bronze material to be install, however it does not specify that these are to be coated. Additionally, due to the fact that all of the buried piping at the plant has not been excavated or inspected there is potential for there to be piping other than carbon steel that is not coated or wrapped. Furthermore, due to the vintage of the plant the industry standard at the time of buried pipe installation may not have required coating or wrapping of non carbon steel piping. Oyster Creek has had no buried pipe failures due to external degradation of an uncoated pipe.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 9/27/2005

Reviewed By: Rafferty-Czincila, Shannon 9/28/2005

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No.
AMP-004

Date Received: 9/21/2005

Source AMP Audit

Topic:
Masonry Walls

Status: Closed

Document References:
B.1.30

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

Masonry WallsThe program description for AMP B.1.30 in the OC LRA indicates that the scope of this program includes all masonry walls that perform an intended function in accordance with 10 CFR 54.4. The applicant is requested to provide the following information related to the scope of this program:(1) Identify whether any additional masonry walls have been added to the scope of the current OC program as a result of the LR scoping and screening process, particularly in light of the requirement to consider regulated events in the LR assessment.(2) If additional masonry walls have been added to the scope, explain how the requirements of I. E. Bulletin 80-11 have been applied to these walls, and describe any physical modifications that have/will be implemented to establish the evaluation bases.(3) If additional masonry walls have been added to the scope, explain why this is not considered an enhancement to the current OC program

Assigned To: Ouaou, Ahmed

Response:

In Response to NRC IE Bulletin 80-11, Masonry Wall Design, Oyster Creek (OC) provided the results of actions taken to ensure that safety related masonry walls, and non-safety related masonry walls whose failure could impact a safety function, satisfy the design requirements of IE Bulletin 80-11. The response identified several walls that required modifications to meet IEB 80-11 criteria because their failure could impact a safety related function. Other walls were qualified by analysis or removed to avoid interaction with safety related equipment. Non-safety related walls whose failure will not impact a safety function were excluded from the scope of IEB 80-11. The NRC review of OC actions is documented in "Safety Evaluation by the Office of Nuclear Reactor Regulation Relating to IE Bulletin 80-11, Masonry Wall Design GPU Nuclear Corporation Jersey Central Power and Light Company Oyster Creek Nuclear Generating Station Docket No. 50-219" (Ref. 1). Additional information related to this topic can be found in NRC Inspection Report No. 50-219/86-09, and Full Term Operation License Safety Evaluation, NUREG-1382.

1. Oyster Creek's practice during the current term is to monitor masonry walls in the reactor building, turbine building, and areas of the office building that contain safety related equipment for cracking. This is regardless whether the walls are in scope of IE Bulletin 80-11 or not. We elected to

conservatively include all these walls in the scope of license renewal and monitor cracking during the extended period of operation consistent with the current term. Only one wall at the entrance to the exhaust tunnel, is not currently monitored. The wall is included in the scope of license renewal and subject to aging management review.

2. The added wall is not specifically addressed in the documentation prepared to evaluate IEB 80-11. However the wall is not classifed safety related, and its failure would not impact a safety related function. As a result we concluded the wall is not subject to the requirements of IEB 80-11. The wall also does not meet 10 CFR 54.4(a)(3) because it is not relied upon in the safety analyses and plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for fire protection (10 CFR 50.48), Environmental Qualification (10 CFR 50.49), ATWS (10 CFR 50.62) or Station Blackout (10 CFR 50.63). Thus the wall is not required to be in scope of license renewal pursuant to 10 CFR 54.4 (a)(1), (a)(2), or (a)(3). The wall provides enclosure and protection from weather elements (rain, wind) to components inside the tunnel. For this reason we elected to include the wall in the scope of license renewal and monitor its aging effects through the Structures Monitoring Program.

3. As noted in Appendix B.1.30, the Masonry Wall Program, is implemented through the Structures Monitoring Program (B.1.31). The Structures Monitoring Program (B.1.31) states that the program will be enhanced to include additional structures determined to be in the scope to 10 CFR 54.4. The Exhaust Tunnel, which includes the masonry wall, is a part of the enhancement to the Structures Monitoring Program (B.1.31)

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 9/28/2005

Reviewed By: Quintenz, Tom 10/ 5/2005

Approved By: Warfel, Don 10/ 5/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-005		9/21/2005	AMP Audit
Topic:		***Status:***	Closed

Masonry Walls

Document References:

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

Masonry Walls The applicant is requested to identify the document(s) that includes the evaluation of the OC program against the program elements of GALL XI.S5, and to make it available in both electronic and hard-copy formats for the on-site AMP audit.

Assigned To: Ouaou, Ahmed

Response:

1. The 10-element review of the Masonry Wall Program is provided in hardy copy. An electronic copy is available to the reviewer.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 10/ 6/2005

Reviewed By: N/A

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-006

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
Coatings

Document References:
B.1.33

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP-6 Coatings From the description of AMP B.1.33 in the OC LRA, it is not completely clear whether Service Level 2 coatings in the sand bed region are the only coatings credited for corrosion protection of metal surfaces. The applicant is requested to clarify whether any Service Level 1 coatings inside the primary containment and any Service Level 2 coatings in areas other than the sand bed region are also credited for corrosion protection

Assigned To: Miller, Mark

Response:

See B.1.33 10-element review OE write-up for additional discussion. See also the 10-element review for AMP B.1.27, ASME Section XI, Subsection IWE.

Corrosion Analysis:
(1) Service Level 2 coatings are non-safety related and are used in areas where coatings failure could impair, but not prevent, normal operating performance. With the exception of the external drywell shell in the area of the sandbed region, Service Level 2 coatings are not normally credited for corrosion protection.
(2) Service Level 1 coatings are not credited for corrosion protection for the drywell shell above the sandbed region. An analysis has been performed which demonstrates that the upper portion of the drywell vessel will meet ASME code requirements for the remaining life of the plant based on corrosion rates. The corrosion of the drywell shell above the sandbed region is considered a TLAA and is further described in LRA Section 4.7.2.
(3) Service Level 1 coatings are credited for corrosion protection for the the vent header and torus.

LOCA Debris Generation and Transport: (extracted from calculation C-1302-241-E610-081, "Suction Strainer Debris Generation and Transport")
(1) Drywell Coating - drywell coating is qualified for a LOCA environment. The mass of coating released following a LOCA jet impingement was conservatively estimated at 47 lbs. No additional coating flaking was assumed due to the harsh environment since the coating is qualified.
(2) Torus and Vent System - coating within the vent system and torus is expected to contribute 0 lbs

of debris to the suction strainer load following a LOCA. However, it was conservatively assumed in the analysis that 10 lbs of debris is attributed to the vent system and torus coating.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Miller, Mark 10/ 3/2005

Reviewed By: Getz, Stu 10/10/2005

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-007

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
Coatings

Document References:
B.1.33

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP-7 Coatings From the description of AMP B.1.33 in the OC LRA, it appears that this AMP is primarily credited for preventive maintenance of Service Level 1 coatings inside the primary containment, in order to minimize coating failures that could adversely affect the operation of post-accident fluid systems and thereby impair safe shutdown. While not committed to RG 1.54, OC is currently committed to a modified version of this RG, as described in its response to GL 98-04, and as detailed in Exelon QATR NO-AA-10. The applicant is requested to make these documents, and also the NRC letter closing out GL 98-04 for OC, available in hard-copy for the on-site AMP audit.

Assigned To: Miller, Mark

Response:

Hardcopies of the B.1.33 10-element review, QATR NO-AA-10 Appendix C Section 1.3.2.6, letter 1940-98-20665 (Oyster Creek Generic Letter 98-04 response), and letter H. Pastis to M. Roche dated January 19, 2000 (NRC acceptance of 98-04 response) obtained for NRC review.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Miller, Mark 10/ 5/2005

Reviewed By: N/A

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-008

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
Coatings

Document References:

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

<u>Question</u>

AMP-8 CoatingsThe applicant is requested to identify the document(s) that includes the evaluation of the OC program against the program elements of GALL XI.S8, and to make it available in both electronic and hard-copy formats for the on-site AMP audit

Assigned To: Miller, Mark

<u>Response:</u>

Hardcopy provided of the 10-element review for the B.1.33 Protective Coatings Monitoring and Maintenance aging management program.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: Miller, Mark 9/27/2005

Reviewed By: N/A

Approved By: Warfel, Don 9/28/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-009

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
Appendix J

Document References:
B.1.29

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP-9 Appendix J The program description for AMP B.1.29 in the OC LRA refers to LLRT of containment isolation valves. The applicant is requested to confirm that LLRT of containment isolation valves is included in the scope of AMP B.1.29, and that this element of the program is credited for aging management of these valves during the extended period of operation.

Assigned To: Getz, Stu

Response:

Local Leak Rate Testing (LLRT) of containment isolation valves (CIVs) is included in the scope of AMP B.1.29 as described in Exelon corporate procedure ER-AA-380 and Oyster Creek procedure ER-OC-380 and is credited for aging management of these valves during the period of extended operation. As stated in the 10-element review for B.1.29, the performance of LLRTs of CIVs in accordance with Option B of 10CFR50, Appendix J provides a record of monitored and trended results for use in managing the aging of the CIV valve bodies.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Getz, Stu 9/28/2005

Reviewed By: Miller, Mark 10/11/2005

Approved By: Warfel, Don 10/12/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-010

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
Appendix J

Document References:
B.1.29

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP-10 Appendix J The applicant is requested to identify the document(s) that includes the evaluation of the OC program against the program elements of GALL XI.S4, and to make it available in both electronic and hard-copy formats for the on-site AMP audit.

Assigned To: Getz, Stu

Response:

The 10-element review of Program B.1.29, Appendix J Testing, will be provided in hardcopy and electronic form for the AMP audit.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Getz, Stu 9/28/2005

Reviewed By: N/A

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-011

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
ASME Section XI ISI,Subsect. IWB,IWB,IWD B.1.1-1

Document References:
B.1.01

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP-11 AMP B.1.1 ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD(B.1.1-1) Please make available at the audit in both hardcopy and electronic format the document(s) that compare the ten elements in OCGS AMP B.1.1 to the ten elements in NUREG-1801 for AMP XI.M1.

Assigned To: Getz, Stu

Response:

The 10-element review of Program B.1.1 will be provided in hardcopy and electronic form for the AMP audit.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Getz, Stu 9/28/2005

Reviewed By: N/A

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-012

Date Received: 9/21/2005

Source AMP Audit

Topic:
ASME Section XI ISI,Subsect. IWB,IWB,IWD B.1.1-2

Status: Closed

Document References:
B.1.01

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD(B.1.1-2) Please address each of the following questions regarding the current status of implementing procedures for this AMP:(a) Please provide the status of the implementing procedures for each enhancement to the existing ASME Section XI ISI, Subsection IWB, IWC, and IWD program.(b) Please provide the schedule for initiating each of the enhancements to the existing ASME Section XI ISI, Subsection IWB, IWC, and IWD program.(c) Please provide a sample of an implementing procedure for one enhancement to the existing ASME Section XI ISI, Subsection IWB, IWC, and IWD program.(d) Please provide the results of any enhanced inspections that have already been completed.[NOTE: Considering the relatively short time period remaining before OCGS enters the license renewal period, the staff expects that considerable progress has already been made in developing and formally documenting the implementing procedures required for new AMPs, and for significant enhancements to existing AMPs

Assigned To: Getz, Stu

Response:

(a) Implementing procedures for enhancements to program B.1.1 have been identified, and several are under development and in draft form. None are complete as of this time.
(b) The enhancement of eddy current testing of the Isolation Condenser tubes, with examination (VT or UT) of the tubesheet and shell head is to be performed during the first ten years of the period of extended operation. Shell water is currently periodically monitored for temperature and radioactivity, and procedure commitments addressing these enhancement activities will be in place prior to the period of extended operation.
(c) A sample of an implementing procedure for an enhancement to the existing ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program is not yet available, but draft input for a revision to Oyster Creek program OC-1, and draft input to a new work order for isolation condenser tube bundle eddy current inspections and inspections of the tubesheet and channel head will be provided for the AMP audit.
(d) No enhanced inspections have been performed as of this time; consequently no inspection results are available.

NRC Information Request Form

LRCR #:		***LRA A.5 Commitment #:***	
IR#:			

Approvals:

Prepared By:	Getz, Stu	9/28/2005
Reviewed By:	Miller, Mark	10/11/2005
Approved By:	Warfel, Don	10/12/2005
NRC Acceptance (Date):	10/ 6/2005	

NRC Information Request Form

Item No
AMP-013

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
ASME Section XI ISI,Subsect. IWB,IWB,IWD B.1.1-3

Document References:
B.1.01

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.1ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD(B.1.1-3) The program description for OCGS AMP B.1.1 lists five aging effects for which this AMP will be credited to manage aging. However, the OCGS LRA also credits AMP B.1.1 for managing aging of CASS components subject to loss of fracture toughness due to thermal aging embrittlement (see Table 3.1.1, item 47), which is not included in this list. Please clarify why this aging effect is not included in the AMP listing and identify any other aging effects for which this AMP is credited in the LRA that are not included in the AMP listing.

Assigned To: Getz, Stu

Response:

Appendix B for B.1.1 lists examples of five methods by which the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program addresses aging effects of loss of material and cracking initiation and growth for which the program is credited to manage aging. No example was listed in the Appendix B summary for B.1.1 for loss of fracture toughness, however the program is also credited with managing the aging effect of loss of fracture toughness due to thermal embrittlement. Cracking Initiation and Growth, Loss of Material, and Loss of Fracture Toughness are the only aging effects credited for this program.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Getz, Stu 9/28/2005

Reviewed By: Miller, Mark 10/11/2005

Approved By: Warfel, Don 10/12/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

NRC Information Request Form

Item No
AMP-014

Date Received: 9/21/2005

Source AMP Audit

Topic:
ASME Section XI ISI,Subsect. IWB,IWB,IWD B.1.1-4

Status: Closed

Document References:
B.1.01

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.1ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1-4) The program description for OCGS AMP B.1.1 states that the program is implemented through procedures that require examinations consistent with ASME Section XI. Please describe, or make available at the audit the OCGS document(s) that describe the qualifications and training requirements for personnel that perform inspections and examinations under the ASME ISI program.

Assigned To: Getz, Stu

Response:

Oyster Creek procedures for qualification and training requirements for personnel performing inspections and examinations under the ASME ISI program will be provided during the AMP audit.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Getz, Stu 9/28/2005

Reviewed By: N/A

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-015

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
ASME Section XI ISI,Subsect. IWB,IWB,IWD B.1.1-5

Document References:
B.1.01

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.1ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1-5) The discussion of exceptions to NUREG-1801 for OCGS AMP B.1.1 states that the Oyster Creek isolation condensers are ISI Class 2 on the tube side and ISI Class 3 on the shell side; therefore, Class 1 ISI requirements do not apply. However, Table 3.21. in the OCGS FSAR identifies the isolation condenser as Class 1. Please clarify this apparent discrepancy. Also, please make available at the audit the OCGS plant-specific document(s) that provide the technical basis for the current isolation condenser ISI classification, as well as the NRC acceptance of this classification as part of the current licensing basis.

Assigned To: Getz, Stu

Response:

The isolation condensers are heat exchangers comprised of ISI Class 2 tube bundle assemblies inserted into ISI Class 3 shell assemblies. The condenser heat exchanger units do not contain any Class 1 components. OCGS UFSAR Table 3.2-1 listing Class 1 systems includes the Isolation Condenser System as the system contains ISI Class 1 piping and components from the attachment points on the reactor to and including the containment isolation valves on both the steam supply side and condensate return side. The piping changes to ISI Class 2 at the isolation valves and continues to the heat exchanger tube bundles as ISI Class 2.

The Oyster Creek Inservice Inspection Program Plan describing the ISI classifications of piping and components including those of the Isolation Condenser system is current licensing basis information. The ISI classification for the isolation condensers has not changed since originally determined, and was included in the submittals of each the 10-year interval inspection programs to the NRC for review and evaluation. Copies of the NRC SERs for the latest of these evaluations will be available for the AMP audit.

LRCR #: *LRA A.5 Commitment #:*

IR#:

NRC Information Request Form

Approvals:

Prepared By:	Getz, Stu	9/28/2005
Reviewed By:	May, Mike	12/20/2005
Approved By:	Warfel, Don	12/20/2005
NRC Acceptance (Date):	10/ 6/2005	

NRC Information Request Form

Item No
AMP-016

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
ASME Section XI ISI,Subsect. IWB,IWB,IWD B.1.1-6

Document References:
B.1.01

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.1ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1-6) The discussion of enhancements for OCGS AMP B.1.1 refers to enhancement activities, which are in addition to the requirements of ASME Section XI, Subsections IWB, IWC, and IWD. Please clarify if these enhancement activities will be included as part of OCGS AMP B.1.1, ASME Section XI ISI program, or if they will be included in a separate aging management program.

Assigned To: Getz, Stu

Response:

As listed in GALL items IV.C1-5 and IV.C1-6, the enhancements for isolation condenser inspection will be included as part of the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program. Inspections of the tube sheet and channel head will be performed as part of the maintenance activities required for performance of the eddy current examinations of the isolation condenser tubes, which is included as part of the B.1.1 program.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Getz, Stu 10/ 3/2005

Reviewed By: May, Mike 12/20/2005

Approved By: Warfel, Don 12/20/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-017

Date Received: 9/21/2005

Source AMP Audit

Topic:
ASME Section XI ISI,Subsect. IWB,IWB,IWD B.1.1-7

Status: Closed

Document References:
B.1.01

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.1ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD(B.1.1-7) The discussion of operating experience for OCGS AMP B.1.1 states that indications of age-related degradation have been successfully identified prior to the loss of the intended functions of the components. Please provide an evaluation, or make available at the audit the document(s) that evaluate past operating experience at OCGS with regard to the failure of components subject to inspection under the ASME Section XI ISI IWB, IWC, and IWD program. Specifically, please provide a comparison of the number of incidents in which age-related degradation was detected prior to the loss of the intended function(s) of the component to the number of incidents in which failures occurred due to age-related degradation without prior detection of the age-related degradation through ISI.

Assigned To: Getz, Stu

Response:

Following each outage, an outage ISI report (NIS-1) is generated summarizing the results of the inspections performed in accordance with the ISI program. Copies of these reports will be made available during the AMP audit for determination of the number of age related degradations discovered. Three occurrences of failures of Core Spray System piping components due to age related degradation have been observed since 1988, the most recent in 2000. These failures were detected during the pressure test portion of the examinations, in low temperature portions not subject to UT testing.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Getz, Stu 9/28/2005

Reviewed By: May, Mike 12/20/2005

NRC Information Request Form

Approved By: Warfel, Don 12/20/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-018

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
ASME Section XI ISI,Subsect. IWB,IWB,IWD B.1.1-8

Document References:
B.1.01

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.1ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD(B.1.1-8) The discussion of operating experience for OCGS AMP B.1.1 states that periodic self-assessments of the ISI programs have been performed to identify the areas that need improvement to maintain program quality. Please make available at the audit the document(s) that provide the results of these self-assessments, including identification of the areas that were found to need improvement and the corrective actions taken.

Assigned To: Getz, Stu

Response:

Results of the most recent Focused Area Self Assessment (FASA) performed on the ISI program will be provided during the AMP audit. The assessment's purpose was to determine whether the Inservice Inspection (ISI) Program is being implemented in compliance with the ASME Section XI code and other guidance documents at OC. Strengths, deficiencies, and recommendations were identified.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Getz, Stu — 9/28/2005

Reviewed By: N/A

Approved By: Warfel, Don — 10/ 6/2005

NRC Acceptance (Date): 10/ 5/2005

NRC Information Request Form

Item No
AMP-019

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
AMP B.1.16

Document References:
B.1.16

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.16Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems(B.1.16-1) Please make available at the audit in both hardcopy and electronic format the document(s) that compare the ten elements in OCGS AMP B.1.16 to the ten elements in NUREG-1801 for AMP XI.M23.

Assigned To: Ouaou, Ahmed

Response:

The 10-Element review for AMP B.1.16, Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling System, is provided to the reviewer in hardcopy. An electronic copy is available to the reviewer.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 9/30/2005

Reviewed By: N/A

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-020

Date Received: 9/21/2005

Source AMP Audit

Topic:
AMP B.1.16

Status: Closed

Document References:
B.1.16

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.16 Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems(B.1.16-2) Considering the relatively short time period remaining before OCGS enters the license renewal period, the staff expects that considerable progress has already been made in developing and formally documenting the implementing procedures required for new AMPs, and for significant enhancements to existing AMPs. In light of this, please address each of the following questions regarding the current status of implementing procedures for this AMP: (a) Please provide the status of the implementing procedures for each enhancement to the existing Inspection of Overhead Handling Systems program. (b) Please provide the schedule for initiating each of the enhancements to the existing Inspection of Overhead Handling Systems program. (c) Please provide a sample of an implementing procedure for one enhancement to the existing Inspection of Overhead Handling Systems program. (d) Please provide the results of any enhanced inspections that have already been completed.

Assigned To: Ouaou, Ahmed

Response:

a) All program enhancements will be completed and issued for implementation by 12/1/2006. Enhancements to the program that are related to cranes and hoists which are accessible only during a refueling outage will be expedited and issued by April 2006. Implementation of the enhancements will be completed by 12/31/2007.
b) The enhancements will be initiated following completion of enhanced procedures.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 9/28/2005

Reviewed By: Getz, Stu 10/ 6/2005

NRC Information Request Form

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-021		9/21/2005	AMP Audit
Topic:		***Status:***	Closed
AMP B.1.16			

Document References:
B.1.16

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.16 Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems(B.1.16-3) The operating experience discussion in OCGS AMP B.1.18 states that the plant operating and maintenance experience review identified no incidents of failure of passive cranes and hoists structural components due to age related degradation. Please make available at the audit the plant-specific document(s) that support this finding.

Assigned To: Ouaou, Ahmed

Response:

The Corrective Action Process (CAP) requires documentation of conditions adverse to quality. For AMP B.1.16 we searched the CAP database to identify if loss of material in passive components of the crane or hoist resulted in dropping the load and impacting safety related SSCs. We did not identify any such case. Therefore we concluded that there were no failures of passive components of cranes and hoists due to age related degradations. See attached CAPs , AR 00347115, 00370648, 00370911, 02003-0660, 02004-0601, 02004-0586, 02000-1446, & 02004-2877.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 9/28/2005

Reviewed By: N/A

Approved By: Warfel, Don 12/20/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-022

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR Reactor Water Cleanup System

Document References:
B.1.18

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.18 BWR Reactor Water Cleanup System(B.1.18-1) Please make available at the audit in both hardcopy and electronic format the document(s) that compare the ten elements in OCGS AMP B.1.18 to the ten elements in NUREG-1801 for AMP XI.M25.

Assigned To: Miller, Mark

Response:

Hardcopy provided of the 10-element review for the B.1.18 BWR Reactor Water Cleanup System aging management program.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Miller, Mark 9/27/2005

Reviewed By: N/A

Approved By: Warfel, Don 9/28/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-023

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR Reactor Water Cleanup System

Document References:
B.1.18

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.18 BWR Reactor Water Cleanup System(B.1.18-2) The program description for OCGS AMP B.1.18 states that this program describes the requirements for augmented ISI for SCC or IGSCC on stainless steel RWCU system piping welds outboard of the second containment isolation valves. Section 2.3.3.32 of the OCGS LRA states that the license renewal boundary includes the non safety-related portion of the RWCU system outboard of the primary containment isolation valves. Please confirm that OCGS AMP B.1.18 is credited for managing aging only for the non safety-related portion of the RWCU system outboard of the containment isolation valves. Also, please clarify which AMP will be used to manage aging for the safety-related portion of the RWCU system inboard of the containment isolation valves.

Assigned To: Miller, Mark

Response:

The BWR Reactor Water Cleanup System aging management program addresses stress corrosion cracking and intergranular stress corrosion cracking in 4 in. or larger austenitic SS, non-safety related, non-RCPB Reactor Water Cleanup System piping (outboard of the second primary containment isolation valves, above 200F). For austenitic SS non-safety related, non-RCPB Reactor Water Cleanup System piping < 4 in., Water Chemistry (B.1.2) and the One-Time Inspection (B.1.24) aging management programs apply.

Stress corrosion cracking and intergranular stress corrosion cracking in 4 in. or larger austenitic SS, safety related, RCPB portions of the Reactor Water Cleanup System (inboard of the second primary containment isolation valves, above 200F) is addressed by the BWR Stress Corrosion Cracking (B.1.7), ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1), and Water Chemistry (B.1.2) aging management programs. For austenitic SS safety related, RCPB Reactor Water Cleanup System piping < 4 in., ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD (B.1.1), Water Chemistry (B.1.2), and the One-Time Inspection (B.1.24) aging management programs apply.

See RWCU AMR for details.

NRC Information Request Form

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Miller, Mark	9/27/2005
Reviewed By:	Getz, Stu	10/10/2005
Approved By:	Warfel, Don	10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-024

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR Reactor Water Cleanup System

Document References:
B.1.18

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.18 BWR Reactor Water Cleanup System(B.1.18-3) The program description for OCGS AMP B.1.18 states that there was a complete lack of cracking found during any of the RWCU piping weld inspections under Generic Letter 88-01. Please make available at the audit the plant-specific documentation that supports this finding.

Assigned To: Miller, Mark

Response:

GPU letter to NRC 1940-00-20096 dated April 13, 2000 (Oyster Creek request to eliminate inspections) and IGSCC Inspection Program OC-2 Section 2.0 "Inspection Results" copied and available for NRC review. No formal response was received from the NRC for letter 1940-00-20096. However, since all required actions identified in previous correspondence with the NRC that would allow for the elimination of the RWCU augmented inspections were completed, no response was expected. Therefore, Oyster Creek considered this request approved.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Miller, Mark 10/ 5/2005

Reviewed By: N/A

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-025

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR Reactor Water Cleanup System

Document References:
B.1.18

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.18 BWR Reactor Water Cleanup System(B.1.18-4) The operating experience discussion for OCGS AMP B.1.18 states that mitigative actions have been implemented to reduce the susceptibility of the RWCU system to IGSCC, including hydrogen water chemistry and noble metals chemical addition. Please indicate when these mitigative actions were initiated at OCGS.

Assigned To: Miller, Mark

Response:

Hydrogen Water Chemistry (HWC) implemented during Cycle 12 (1990). Noble Metals Chemical Addition (NMCA) implemented in 1R19 outage (2002). IGSCC Inspection Program OC-2 Section 3.0 "Mitigating Actions" copied and available for NRC review.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Miller, Mark 9/27/2005

Reviewed By: N/A

Approved By: Warfel, Don 9/28/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-026

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
Fuel Oil Chemistry

Document References:
B.1.22

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

<u>Question</u>

AMP B.1.22 Fuel Oil Chemistry(B.1.22-1) Please make available at the audit in both hardcopy and electronic format the document(s) that compare the ten elements in OCGS AMP B.1.22 to the ten elements in NUREG-1801 for AMP XI.M30.

Assigned To: Miller, Mark

<u>Response:</u>

Hardcopy provided of the 10-element review for the B.1.22 Fuel Oil Chemistry aging management program.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: Miller, Mark 9/27/2005

Reviewed By: N/A

Approved By: Warfel, Don 9/28/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-027

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
Fuel Oil Chemistry

Document References:
B.1.22

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.22 Fuel Oil Chemistry(B.1.22-2) Considering the relatively short time period remaining before OCGS enters the license renewal period, the staff expects that considerable progress has already been made in developing and formally documenting the implementing procedures required for new AMPs, and for significant enhancements to existing AMPs. In light of this, please address each of the following questions regarding the current status of implementing procedures for this AMP: (a) Please provide the status of the implementing procedures for each enhancement to the existing Fuel Oil chemistry program. (b) Please provide the schedule for initiating each of the enhancements to the existing Fuel Oil Chemistry program. (c) Please provide a sample of an implementing procedure for one enhancement to the existing Fuel Oil Chemistry program. (d) Please provide the results of any enhanced inspections that have already been completed.

Assigned To: Miller, Mark

Response:

Response:
(a) All identified procedures and station work orders have been drafted (markups) to implement the Fuel Oil Chemistry aging management program, B.1.22. See "Gap Analysis" document for a correlation of commitment to implementing document.
(b) Implementation schedule TBD.
(c) All draft markups are available for review.
(d) No enhanced inspections have been implemented yet.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Miller, Mark 9/27/2005

Reviewed By: N/A

NRC Information Request Form

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-028

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
Fuel Oil Chemistry

Document References:
B.1.22

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.22 Fuel Oil Chemistry(B.1.22-3) The program description for OCGS AMP B.1.22 states that fuel oil will be routinely sampled and analyzed for particulate and for the presence of water and sediment. Please provide, or make available at the audit the document(s) that provide the frequency of these activities, along with the technical basis used to establish the frequency. Also, please make available at the audit copies of ASTM Standard D 2276-00 Method A and ASTM Standard D 2709-96.

Assigned To: Miller, Mark

Response:

The frequencies for the analysis of particulate and for the analysis of water and sediment are identified in station procedure Number 828.7 "Secondary Systems Analysis: Plant Oil". This procedure has been marked up to include the enhancements identified in the program documents for the Fuel Oil Chemistry aging management program. Attachment 828.7-3 identifies sample locations, sample frequencies, and testing parameters/acceptance criteria. All analysis frequencies are quarterly or more frequent. This is in accordance with NUREG-1801 XI.M30 which states in Program Element 5 "Monitoring and Trending" that "based on industry operating experience, quarterly sampling and analysis of fuel oil provide for timely detection of conditions conducive to corrosion...". Copies of ASTM Standard D 2276-00 and ASTM Standard D 2709-96 are available.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Miller, Mark 9/27/2005

Reviewed By: Getz, Stu 10/10/2005

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

NRC Information Request Form

Item No
AMP-029

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
Fuel Oil Chemistry

Document References:
B.1.22

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.22 Fuel Oil Chemistry(B.1.22-4) The program description for OCGS AMP B.1.22 states that fuel oil tanks are periodically drained of accumulated water and sediment, and will be periodically drained, cleaned, and internally inspected. Please provide, or make available at the audit the document(s) that provide the frequency of these activities, the technical basis used to establish the frequency, and the identification of each tank to which the activities apply. Also, please make available at the audit a copy of the latest OCGS implementing procedure used for draining, cleaning, and inspecting the EDG Fuel Storage tank, along with results from previous inspections of the tank.

Assigned To: Miller, Mark

Response:

The following implementing activities address the periodic draining of accumulated water and sediment and have been marked-up to include the enhancements identified in the program documents for the Fuel oil Chemistry aging management program:
(1) Recurring task work order R0801584 (T-9-103, Fire Pond Diesel Fuel Oil Storage Tank "A"). The periodic draining of accumulated water and sediment is performed quarterly.
(2) Recurring task work order R0801586 (T-9-104, Fire Pond Diesel Fuel Oil Storage Tank "B"). The periodic draining of accumulated water and sediment is performed quarterly.
(3) Recurring task work order R2045449 (T-36-1, Fuel Oil Storage Tank). The periodic draining of accumulated water and sediment is performed quarterly.
(4) Recurring task work order R2044252 (T-39-2, Diesel Generator Fuel Oil Storage Tank). The periodic draining of accumulated water and sediment is performed quarterly.
Quarterly draining of accumulated water and sediment is in alignment with NUREG-1801 XI.M30 which states in Program Element 5 "Monitoring and Trending" that "based on industry operating experience, quarterly sampling and analysis of fuel oil provide for timely detection of conditions conducive to corrosion...".

The following implementing activities address the periodic draining, cleaning, and internal inspection and have been marked up to include the enhancements identified in the program documents for the Fuel oil Chemistry aging management program:

NRC Information Request Form

(1) Recurring task work order R2060569 (T-9-103, Fire Pond Diesel Fuel Oil Storage Tank "A"). The periodic draining, cleaning, and internal inspection is performed every 5 years based on the "Tanks" PCM template, criticality determination, duty cycle, and service condition.
(2) Recurring task work order R2060570 (T-9-104, Fire Pond Diesel Fuel Oil Storage Tank "B"). The periodic draining, cleaning, and internal inspection is performed every 5 years based on the "Tanks" PCM template, criticality determination, duty cycle, and service condition.
(3) Recurring task work order Rxxxxxxx (new) (T-36-1, Fuel Oil Storage Tank). The periodic draining, cleaning, and internal inspection will be performed every 10 years based on the "Tanks" PCM template, criticality determination, duty cycle, and service condition.
(4) Recurring task work order R2042556 (T-39-2, Diesel Generator Fuel Oil Storage Tank). The periodic draining, cleaning, and internal inspection is performed every 10 years based on the "Electro-Motive Division Diesel Generator" PCM template, criticality determination, duty cycle, and service condition.

The EDG fuel oil storage tank (T-39-2) was last opened, cleaned, and inspected in Oct/Nov 2004 under recurring task work order R2049448. Tank inspection results are included in PCA Engineering, Inc. letter dated November 8, 2004. Inspection recommendations and findings are addressed in Corrective Action CAP O2004-3745. Hardcopies of these documents were provided to B. Lofaro on 10/3/2005.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 10/ 3/2005

Reviewed By: Getz, Stu 10/10/2005

Approved By: Warfel, Don 10/16/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-030

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
Fuel Oil Chemistry

Document References:
B.1.22

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.22 Fuel Oil Chemistry(B.1.22-5) The program description for OCGS AMP B.1.22 does not discuss the use of protective coatings on the fuel oil tanks. Please clarify whether protective coatings are used on any of the fuel oil tanks.

Assigned To: Miller, Mark

Response:

Protective coatings are discussed in element 2 "Preventive Actions" of the 10-element review for the Fuel Oil Chemistry aging management program. The EDG Fuel Storage Tank and Main Fuel Oil Tank are internally coated to mitigate corrosion by protecting the internal surfaces of the tanks from contact with water and microbiological organisms. The EDG Day Tanks and Fire Pond Diesel Fuel Tanks are carbon steel and do not have coated interior surfaces.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 9/27/2005

Reviewed By: Getz, Stu 10/10/2005

Approved By: Warfel, Don 10/10/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-031

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
Fuel Oil Chemistry

Document References:
B.1.22

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

<u>Question</u>

AMP B.1.22 Fuel Oil Chemistry(B.1.22-6) The first exception to NUREG-1801 in OCGS AMP B.1.22 states that the EDG Fuel Storage Tank is routinely sampled and analyzed. Please provide, or make available at the audit the document(s) that provide the frequency of these activities, along with the technical basis used to establish the frequency.

Assigned To: Miller, Mark

<u>Response:</u>

The limits and analysis frequencies for the EDG Fuel Storage Tank samples are identified in the markup of station procedure Number 828.7 "Secondary Systems Analysis: Plant Oil", Attachment 828.7-3. The following frequency/analysis are performed for the EDG Fuel Storage Tank:
(1) Weekly - partial on-site lab fuel oil anaysis (API gravity, water and sediment, and kinematic viscosity)
(2) Weekly - complete off-site lab fuel oil anaysis (particulate contamination, bacteria, API gravity, water and sediment, kinematic viscosity, sulfur content, flash point, cloud point, ash, distillation temperature, cetane index, carbon residue, and copper strip corrosion)
(3) After transfer from Main Fuel Oil Tank - partial on-site lab fuel oil anaysis (API gravity, water and sediment, and kinematic viscosity)
(4) Monthly - oxidation stability
(5) Monthly - water and sediment (bottom sample)

Fuel deliveries to the Main Fuel Oil Tank or directly to the EDG Fuel Storage Tank are sampled as follows:
(1) on-site water and sediment and API gravity analysis before the tanker unloads
(2) complete off-site lab fuel oil anaysis (particulate contamination, bacteria, API gravity, water and sediment, kinematic viscosity, sulfur content, flash point, cloud point, ash, distillation temperature, cetane index, carbon residue, and copper strip corrosion)

All frequencies are less than that specified in NUREG-1801 XI.M30 which states in Program Element 5 "Monitoring and Trending" that "based on industry operating experience, quarterly sampling and

analysis of fuel oil provide for timely detection of conditions conducive to corrosion...".

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Miller, Mark 9/27/2005

Reviewed By: Getz, Stu 10/10/2005

Approved By: Warfel, Don 10/10/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-032

Date Received: 9/21/2005

Source AMP Audit

Topic:
Fuel Oil Chemistry

Status: Closed

Document References:
B.1.22

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.22 Fuel Oil Chemistry (B.1.22-7) The first exception to NUREG-1801 in OCGS AMP B.1.22 states that the EDG Day Tanks experience a high turnover rate of fuel, and that stratification of the fuel is not likely to occur due to this high turnover rate. Please provide an explanation, or make available at the audit the document(s) that explain the turnover rate of the EDG Day Tanks, along with the technical basis for concluding that stratification of the fuel in these tanks will not occur. Also, please make available at the audit the P&IDs and elevation drawings showing the various EDG and main fuel oil tanks, and their interconnecting piping.

Assigned To: Miller, Mark

Response:

Multilevel sampling and tank bottom sampling of the EDG Day Tanks are not routinely performed at Oyster Creek. The EDG Day Tanks do not have the capability of being sampled, however, these tanks are supplied directly from the EDG Fuel Storage Tank, which is routinely sampled and analyzed. The EDG Day Tanks are small in size (130 gallons) and experience a high turnover rate of the fuel stored within as a result of routine engine operations. During diesel generator load testing (reference procedure Number 636.4.003 and 636.4.013), approximately 200 gallons of fuel oil will be consumed (approximately 1 hour of operation @ 200 gallons/hour). Depending on the day tank level (normal level is "above 1/4 full"), the day tank contents may turnover multiple times during load testing which is performed every 14 days. Stratification of fuel is not likely to occur in the EDG Day Tanks due to this high turnover rate. Additionally, the Emergency Diesel Generator Day Tanks are skid mounted on the Emergency Diesel Generator skid and are enclosed within the diesel enclosure, which is maintained at a constant temperature during cold periods through operation of the Emergency Diesel Generator keepwarm system. Maintaining a constant temperature during cold periods minimizes Emergency Diesel Generator Day Tank thermal cycling and reduces the potential for condensation formation within the day tanks.

The System Manager (Skelskey) has been requested to provide any elevation drawings he may have of the day tanks and associated piping.

LRCR #:

LRA A.5 Commitment #:

NRC Information Request Form

IR#:

Approvals:

Prepared By:	Miller, Mark	9/29/2005
Reviewed By:	Getz, Stu	10/10/2005
Approved By:	Warfel, Don	10/11/2005
NRC Acceptance (Date):	10/ 6/2005	

NRC Information Request Form

Item No
AMP-033

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
Fuel Oil Chemistry

Document References:
B.1.22

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.22 Fuel Oil Chemistry (B.1.22-8) The second exception to NUREG-1801 in OCGS AMP B.1.22 states that sampling of the EDG Fuel Storage Tank is not directly comparable to ASTM D 4057-95. Please provide a comparison, or make available at the audit the document(s) that compares the OCGS sampling procedure to ASTM D 4057-95 and identifies areas where they are not comparable. Also, please make available at the audit a copy of the OCGS implementing procedure for sampling the EDG Fuel Storage Tank, along with a copy of ASTM D 4057-95.

Assigned To: Miller, Mark

Response:

Sampling of the Emergency Diesel Generator Fuel Storage Tank, although not directly comparable to any of the tank sampling methods described in ASTM D 4057-95 (2000), ensures that an "all levels" sample and a bottom sample are obtained. The EDG Fuel Storage Tank is equipped with a sample station that includes a sample recirculation pump and sample collection points located internal to the tank at several tank elevations, thus making the Emergency Diesel Generator Fuel Storage Tank sample station effective for obtaining "all level" samples. Tank bottom samples are obtained through a sample line located off of the bottom of the tank sump which is specifically designed to collect the condensation/moisture and sediment from within the tank.

Sample Station Discussion: From drawings CHO 082-1 and CHO 082-2, there are four 3/8" tubes and one 1/4" tube used for sampling the tank. The 1/4" tube bottom is 6" from the tank bottom and is capped at the top of the tank, this tube is not used. From the drawing and walkdown of the sample station, the bottom sample is taken from a tube that ends 1/2" from the bottom of the sump (about 5 1/4" below the tank bottom). The bottom sample is pulled by a pump that recirculates the oil back into the tank, discharging about 30" from the bottom of the tank. Sampling of the EDG Fuel Oil Tank bottoms is performed in accordance with procedure 828.7, section 9.1.9. The tank sample is taken from a tube that ends 1/2" from the bottom of the tank. This sample is pulled by a pump and recirculated back into the tank, discharging about 30" from the tank bottom. The sampling technique used for the EDG Fuel Oil Tank is performed in accordance with procedure 828.7, section 9.1.6.

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Drawings CHO 082-1 and CHO 082-2 and ASTM D 4057-95(2000) are available for review.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 9/27/2005

Reviewed By: Getz, Stu 10/10/2005

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-034

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
Fuel Oil Chemistry

Document References:
B.1.22

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.22 Fuel Oil Chemistry (B.1.22-9) The Operating Experience discussion in OCGS AMP B.1.22 states that high concentrations of water and sediment have been found in the fuel oil tanks in the past. Also, corrective actions were taken and improved test methods were implemented as a result of these findings. Please make available at the audit the plant-specific documentation describing this past operating experience together with the OCGS evaluation of these findings. Also, please explain, or make available at the audit the document(s) that explain the corrective actions taken, as well as the improved test methods that were implemented.

Assigned To: Miller, Mark

Response:

Corrective Actions CAP No. O2003-1865 and No. O2003-2076 identify the referenced issue along with the associated Oyster Creek evaluation and corrective actions. These document are available for review at the audit.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Miller, Mark 9/27/2005

Reviewed By: N/A

Approved By: Warfel, Don 9/30/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-035

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
One-Time Inspection

Document References:
B.1.24

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.24 One-Time Inspection(B.1.24-1) Please make available at the audit in both hardcopy and electronic format the document(s) that compare the ten elements in OCGS AMP B.1.24 to the ten elements in NUREG-1801 for AMP XI.M32

Assigned To: Miller, Mark

Response:

Hardcopy provided of the 10-element review for the B.1.24 One-Time Inspection aging management program.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Miller, Mark 9/29/2005

Reviewed By: N/A

Approved By: Warfel, Don 9/30/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-036

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
One-Time Inspection

Document References:
B.1.24

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

AMP B.1.24 One-Time Inspection(B.1.24-2) Considering the relatively short time period remaining before OCGS enters the license renewal period, the staff expects that considerable progress has already been made in developing and formally documenting the implementing procedures required for new AMPs, and for significant enhancements to existing AMPs. In light of this, please address each of the following questions regarding the current status of implementing procedures for this AMP: (a) Please provide the status of the implementing procedure for each one-time inspection credited in the OCGS LRA. (b) Please provide the schedule for performing each of the one-time inspections credited in the LRA. (c) Please provide a sample of a one-time inspection implementing procedure. (d) Please provide the results of any one-time inspections that have already been completed.

Assigned To: Miller, Mark

Response:

Response:
(a) All required station work order requests have been drafted to implement the One-Time Inspection aging management program, B.1.24. See "Gap Analysis" document for a correlation of commitment to implementing document.
(b) Implementation schedule TBD.
(c) All draft work order requests are available for review.
(d) No inspections have been performed to date.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 9/29/2005

Reviewed By: Corsi, Lou 10/10/2005

NRC Information Request Form

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-037

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
One-Time Inspection

Document References:
B.1.24

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.24 One-Time Inspection(B.1.24-3) The program description for OCGS AMP B.1.24 lists seven intended uses of this program. However, the OCGS LRA includes the following intended uses for this AMP that are not included in this list:· (1) Verify the effectiveness of the Selective Leaching of Materials program, AMP B.1.25 (see Table 3.3.1, item 43); (2) Verify the effectiveness of the 10 CFR Part 50, Appendix J program, AMP B.1.29 (see Section 3.3.2.2.7, item 3); (3) Verify the effectiveness of the Generator Stator Water Chemistry Activities program, AMP B.2.3 (see Section 3.3.2.2.7, item 3 and 3.3.2.2.10, item 2). Please clarify why the intended uses listed above are not listed in the program description for OCSG AMP B.1.24. Also, please identify any other intended uses that are not listed.

Assigned To: Miller, Mark

Response:

(1) In LRA Table 3.3.2.1.29 "Reactor Building Closed Cooling Water System," the One-Time Inspection program was identified (with an "E" Industry Standard Note) in addition to the Closed-Cycle Cooling Water System aging management program and Selective Leaching of Materials aging management program for cast iron pipe exposed to a closed cooling water environment as specified for GALL Vol #2 VII.C2-7 (A-50). The One-Time Inspection aging management program does not verify the effectiveness of the Selective Leaching of Materials aging management program. As described in AMP B.1.25, The Selective Leaching of Materials aging management program is itself a one-time inspection to confirm that loss of material due to the selective leaching aging mechanism is not occurring. The One-Time Inspection aging management program does verify the effectiveness of the Closed Cycle Cooling Water aging management program (in stagnant or low flow piping areas only) at managing the loss of material due to pitting and crevice corrosion.

(2) The verification of the effectiveness of the 10 CFR Part 50, Appendix J aging management program, AMP B.1.29, is included in the Program Description of OCGS AMP B.1.24 as "To confirm loss of material in steel piping, piping components, and piping elements is insignificant in an indoor air (internal) environment."

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(3) The verification of the effectiveness of the Generator Stator Water Chemistry Activities aging management program, AMP B.2.3, is included in the Program Description of OCGS AMP B.1.24 as "To confirm the effectiveness of the Water Chemistry program to manage the loss of material and crack initiation and growth aging effects."

LRCR #: 227 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 9/30/2005

Reviewed By: Corsi, Lou 10/10/2005

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-038

Date Received: 9/21/2005
Source AMP Audit
Status: Closed

Topic:
One-Time Inspection

Document References:
B.1.24

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.24 One-Time Inspection(B.1.24-4) The program description for OCGS AMP B.1.24 states that one intended use of this AMP is to confirm crack initiation and growth is not occurring in Class 1 piping less than four-inch nominal pipe size. The September 2005 version of GALL includes a new one-time inspection program that specifically addresses inspection of small-bore piping; XI.M35, One-Time Inspection of ASME Code Class 1.Small Bore Piping. Please provide an evaluation, or have available at the audit the document(s) that evaluate the OCGS AMP B.1.24 against the GALL AMP XI.M35 to demonstrate that the OCGS AMP is consistent with the recommendations in GALL AMP XI.M35

Assigned To: Miller, Mark

Response:

Reconciliation to the September 2005 version of GALL will be completed as indicated in the July 22nd LRA letter (2130-05-20135).

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 9/29/2005

Reviewed By: Corsi, Lou 10/10/2005

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

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Item No AMP-039	***Date Received:*** 9/21/2005 ***Source*** AMP Audit
Topic: One-Time Inspection	***Status:*** Closed

Document References:
B.1.24

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.24 One-Time Inspection(B.1.24-5) The program description for OCGS AMP B.1.24 states that the new program elements include (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. (a) Please provide a description, or make available at the audit the document(s) that describe the process to be used for performing the activities delineated in each of these elements, including sources of information to be used and the criteria upon which decisions will be made. (b) With regard to identifying the inspection locations, please provide a description, or make available at the audit the document(s) that describe the process to be used in identifying the more susceptible materials and the potentially more aggressive environments for the various types of systems in which this AMP will be applied, including sources of information to be used and the decision making criteria. (c) With regard to determination of the examination technique, please provide a description, or make available at the audit the document(s) that describe the process to be used in determining which type of examination will be used, including sources of information to be used and the decision-making criteria. (d) Please describe the qualifications and training requirements to be implemented for personnel performing the one-time inspections.

Assigned To: Miller, Mark

Response:

An Inspection Sample Basis document has been prepared for One-Time Inspections. This document is available for review and provides information on component population, sample population and expansion criteria for the various applications of the One-Time Inspection program. Implementation of the One-Time Inspections will be through the normal maintenance planning process. Procedures MA-MA-716 and WC-AA-101 describe this process and are available for review. An example of a work request is also included.

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LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Miller, Mark	9/29/2005
Reviewed By:	Corsi, Lou	10/10/2005
Approved By:	Warfel, Don	10/11/2005
NRC Acceptance (Date):	10/ 6/2005	

NRC Information Request Form

Item No
AMP-040

Date Received: 9/21/2005

Source AMP Audit

Topic:
One-Time Inspection

Status: Closed

Document References:
B.1.24

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.24 One-Time InspectionB.1.24-6 The conclusion section for OCGS AMP B.1.24 states in the last sentence there would be no need to manage an aging related degradation for the period of extended operation. However, as noted in program description, one of the intended uses of this AMP is to verify the effectiveness of other AMPs that are being credited to manage specific aging effects. Please clarify the intent of the last sentence in the conclusion.

Assigned To: Miller, Mark

Response:

The last two (2) sentences read: "The new One-Time Inspection program will provide reasonable assurance that either an aging effect is not occurring, or the aging effect is occurring so slowly that the intended function of the component or structure consistent with the current licensing basis is not affected. In either case there would be no need to manage an aging related degradation for the period of extended operation." The intent of this is that additional inspection activites beyond those already included in aging management programs that the One-Time Inspection program verifies will not be required. For example, when verifying the effectiveness of a chemistry program to manage an aging effect, if the One-Time Inspection activity identifies no unacceptable aging effect, the chemistry program alone will adequately manage the effects of aging. Conversely, if the One-Time Inspection activity identifies an unacceptable aging effect, the One-Time Inspection will trigger the development of a program, in addition to the chemistry program, necessary to assure component intended functions through the period of extended operation.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Miller, Mark 9/29/2005

Reviewed By: Corsi, Lou 10/10/2005

NRC Information Request Form

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-041

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
WATER CHEMISTRY

Document References:
B.1.02

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.2 WATER CHEMISTRY(B.1.2-1) Please make available at the audit in both hardcopy and electronic format the document(s) that compare the ten elements in OCGS AMP B.1.2 to the ten elements in NUREG-1801 for AMP XI.M2.

Assigned To: Rafferty-Czincila, Shannon

Response:

A copy will be provided during the audit.
- Copies provided on 10/3/05.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 9/29/2005

Reviewed By: Hufnagel, John 9/29/2005

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-042

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
WATER CHEMISTRY

Document References:
B.1.02

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.2 WATER CHEMISTRY(B.1.2-2) Under Exceptions, the applicant states that the OCGS Water Chemistry Program for monitoring and controlling the water chemistry of the reactor and other treated water is based on BWRVIP-130: BWR Vessel and Internals Project BWR Water Chemistry Guidelines, (2004), which is EPRI TR-103515-R3. The September '05 GALL update recommends BWRVIP-29 (1996), which is TR-103515-R1, or later revisions. While the staff has not formally reviewed and accepted any later revision of this document, the staff's SER for the Dresden/Quad Cities LRA (NUREG-1769) has previously accepted BWRVIP-79 (2000), which is TR-103515-R2.In transitioning from BWRVIP-79 to BWRVIP-130, OCGS has reviewed BWRVIP-130, and has determined that the most significant change is that a recent policy of the U.S. nuclear industry commits each nuclear utility to adopt the responsibilities and processes on the management of materials aging issues described in NEI 03-08: Guideline for the Management of Materials Issues. Section 1 of BWRVIP-130 specifies which portions of the document are Mandatory, Needed, or Good Practices, using the classification described in NEI 03-08. A new section (section 7) has been added and contains goals for water chemistry optimization. These are good practice recommended targets that plants may use in optimizing water chemistry in order to balance the conflicting requirements of materials, fuel and radiation control. Oyster Creek has not committed to obtaining these targets; and has concluded that all other changes between BWRVIP-79 and BWRVIP-130 do not change the original intent of revision 2 implementation. To assist the staff in determining the adequacy of the applicant's Water Chemistry Program, the applicant is requested to (a.)Provide an electronic and hard copy of BWRVIP-130 during the audit.(b.)Provide an electronic and hard copy of NEI 03-08 during the audit.(c.)Identify the specific differences between BWRVIP-79 and BWRVIP-130.(d.)Provide the technical basis for the disposition of each difference. Include the good practice BWRVIP-130 recommendations for optimizing the water chemistry.(e.)Describe the current status of the OCGS Water Chemistry Program with respect to Hydrogen Water Chemistry (HWC), Noble Metal Chemical Application (NMCA), and Zinc Injection. Identify when these programs started and their impact on the operation of plant systems and the degradation of component materials.

Assigned To: Rafferty-Czincila, Shannon

Response:

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(a.)Provide an electronic and hard copy of BWRVIP-130 during the audit.
- A copy will be provided during the audit
- Copies provided on 10/3/05.

(b.)Provide an electronic and hard copy of NEI 03-08 during the audit.
- A copy will be provided during the audit
- Copies provided on 10/3/05.

(c.)Identify the specific differences between BWRVIP-79 and BWRVIP-130.
- The key differences between EPRI TR 103515, Revision 2, "BWR Water Chemistry Guidelines 2000 Revision and 2004 Revision of the BWR Water Chemistry Guidelines" BWRVIP-130 are as follows.

i. Section 1. A recent policy of the U.S. nuclear industry commits each nuclear utility to adopting the responsibilities and processes on the management of materials aging issues described in NEI 03-08: Guideline for the Management of Materials Issues. Section 1 of the BWR Water Chemistry Guidelines specifies which portions of the document are Mandatory, Needed, or Good Practices, using the classification described in NEI 03-08.

ii. Section 2 discusses the technical basis for water chemistry control of IGSCC. This Section has been updated with the latest information on the effects of impurities such as sulfate and chloride on crack growth rate and covers a wider range of electrochemical potential (ECP). The strong effect of copper ions on the effectiveness of hydrogen water chemistry (HWC) is detailed. The overall goal of demonstrating the effectiveness of mitigating IGSCC of piping and reactor internals using HWC and NMCA is discussed in detail, including the Guidelines' relationship to inspection relief programs contained in BWRVIP-62 and BWRVIP-75. Noble metal considerations are discussed in each section of the document, referencing the NMCA Experience Report and Application Guidelines – 2003 Revision (BWRVIP-118).

iii.Section 3 covers radiation field effects of water chemistry. The discussion of the effects of NMCA and zinc injection on radiation fields has been updated with the most recent plant data. The discussion on control of feedwater iron has been strengthened, with the recognition that iron increases fuel crud formation and decreases the efficiency of zinc. The desired range" recommendations for feedwater iron have been specified as 0.1 1.5 ppb for HWC and NMCA plants, and 0.5 – 1.5 ppb for normal water chemistry plants.

iv. Section 4 covers Flow Accelerated Corrosion (FAC) and now includes the effects of NMCA.

v.Section 5 discusses water chemistry impacts on fuel integrity, and now includes a discussion of corrosion-related fuel failures. The need for control of feedwater zinc, iron and copper is discussed. Based on fuel integrity issues, quarterly average maxima for feedwater zinc of 0.6 ppb for HWC plants and 0.4 ppb for NMCA plants are recommended.

vi. Section 6 comprises the recommendations for water chemistry control and diagnostic parameters. These now include separate tables for hydrogen water chemistry, HWC/ NMCA and normal water chemistry. The Action Level tables now address the possibility that IGSCC may be reduced with

continued operation if the Action Levels are exceeded.

vii. Section 7 is a new section containing recommended goals for water chemistry optimization. These are good practice recommendations for targets that plants may use in optimizing water chemistry that balances the conflicting requirements of materials, fuel and radiation control. Significant time and expense may be required to meet these targets; thus efforts to achieve these goals should be considered in the context of the overall strategic plan for the plant.

viii. Section 8 discusses recommended chemistry surveillance. Recommendations from the 2000 revision of the Guidelines were reviewed. In support of the utilities' need to reduce O&M costs, recommended surveillance and monitoring frequencies were reduced when such could be done without significant adverse impact on plant chemistry.

ix. Appendix A discusses the effects of impurity transients on crack growth rates. It has been considerably enhanced, including two tables of documented BWR transients that have occurred during operation and shutdown, possible water chemistry responses to transients plus examples of decision trees for evaluating actions to minimize the detrimental effects on IGSCC.
x. Appendix B covers auxiliary systems.
xi. Appendix C is new. It addresses calculations that may be made to correct the measured conductivity for the presence of ionic species that are benign toward system integrity.
xii. Appendix D is a new appendix covering ultrasonic fuel cleaning.
xiii. Appendix E updates the appendix on the BWRVIA model in the 2000 revision

(d.)Provide the technical basis for the disposition of each difference. Include the good practice BWRVIP-130 recommendations for optimizing the water chemistry.
- Because the September '05 GALL update recommends BWRVIP-29 (1996), which is TR-103515-R1, or later revisions, which would be BWRVIP-130. Therefore OC can say that they are in compliance with the GALL since the OC LRA is being compared with the September '05 GALL. Additionally, all of the Exelon Corporate/implementing procedures have been revised with the supporting evaluations to be in compliance with BWRVIP-130. A copy of these procedures and change evaluations were provided on10/4/04.
- Differences between the 2000 Revision and 2004 Revision (BWRVIP-130) were evaluated during preparation of the LRA. The comparisons demonstrate that use of the 2004 Revision (BWRVIP- 130) of the water chemistry guidelines provides acceptable guidance as it is based on updated industry experience.

The 2004 Revision of the BWR Water Chemistry Guidelines was issued in October 2004. The guidelines were revised to:
- Identify which portions of the document are mandatory, needed, or good practice considerations consistent with Nuclear Energy Institute (NEI) guidelines for the management of material issues
- Update the technical basis for water chemistry control of Intergranular Stress Corrosion Cracking (IGSCC) using recent industry experience
- Discuss the effects of Noble Metal Chemical Application (NMCA) and zinc injection on radiation fields using recent industry experience,

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- For Reactor Water (HWC or HWC +NMCA - Power Operation) a monthly copper sample is now required (OC was already performing this)
- For Reactor Water NWC (Normal Water Chemistry) a monthly copper sample was added
- An Action Level 1 limit of -230 was added for ECP, but no monitoring frequency has been defined
- For Feedwater and Condensate, an integrated Feedwater Total Zinc was added as a parameter, limit defined based on plant chemistry (0.4 ppb for NMCA plants)
    o OC has guidance from our fuel vendor (GE) that enables zinc injection up to 0.8 ppb with a goal of 0.6 ppb.
- Strengthen the discussion of corrosion-related fuel failures including control of zinc, iron, and copper levels
- The Recommended BWR Chemistry Database Parameters (Table 8-1) has changed a few frequencies from 2/D to 1/D. (Table 5-1 in BWRVIP-79)
    o Reactor Coolant, Reactor Temp & Conductivity 2/D to 1/D
    o Phosphate, Sodium, Calcium & Magnesium were added to the table
    o Zinc changed from 1/M to 1/W
    o Monitoring of H and Au (S/I) were added at 1/M and 2/M respectively
    o Co (S/I) and Zn (S/I) changed from 2/M to 1/W
    o RWCU Flow and Conductivity changed from 2/D to 1/D
    o Chromium (S/I) was added to Feedwater at 1/M.
- Address the possibility that IGSCC may be reduced with continued operation if the Action Levels are exceeded
- Add recommended goals for optimizing water chemistry that balances conflicting requirements of materials, fuel, and radiation control
- Relax recommended surveillance frequencies for some parameters to reduce operating cost without creating a significant adverse impact on plant chemistry
- Update the discussion on BWR transient effects on IGSCC
- Include methods for adjusting conductivity measurements based on the presence of ionic species
- Add a new appendix covering ultrasonic fuel cleaning.
- Chemical parameters, frequency of measurement, Action Levels, and limits remain essentially unchanged except as follows:
- The Action Level definitions were clarified to provide additional guidance for addressing chemistry transients, including the establishment of an action time period for the most severe out of limit conditions (Action Level 3)
- For reactor water during startup/hot standby, dissolved oxygen and NMCA were moved from control to diagnostic parameters (limits and measurement frequencies remained unchanged). Also, insoluble iron was removed as a diagnostic parameter. However, it remains part of the suspended corrosion products monitoring of reactor feedwater/condensate prior to initiation of significant feedwater flow or at completion of cleanup.
- For reactor feedwater/condensate during startup/hot standby, suspended corrosion products was moved from control to diagnostic parameters. The limits and measurement frequency remain unchanged.
- Auxiliary water chemistry guidelines remain unchanged except for the addition of phosphate as a diagnostic parameter for Demineralized Water Storage Tanks (DWST) and Condensate Storage Tanks (CSTs) and the lowering of the conductivity limit for the spent fuel pool.

In summary, no significant changes to critical program elements have resulted in adopting the 2004

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Revision of the water chemistry guidelines (BWRVIP-130). The technical basis and guidance have been updated at each revision to include additional industry experience.

Final Response: The OC LRA notes the Plant Chemistry Program relies upon the 2004 Revision of the guidelines (EPRI TR-1008192, BWRVIP-130) and not BWRVIP-29 as specified in the GALL. The LRA further notes differences between earlier revisions and the 2000 revision of the water chemistry guidelines were previously found acceptable by the NRC because the 2000 Revision is based on updated industry experience. The OC LRA notes the 2004 Revision was similarly based on updated industry experience.

Additionally, in Appendix B.1.02 of the LRA, exception 2 states, "A new section (section 7) has been added and contains recommended goals for water chemistry optimization. These are "good practice" recommendations for targets that plants may use in optimizing water chemistry that balances the conflicting requirements of materials, fuel and radiation control. Significant time and expense may be required to meet these targets; thus efforts to achieve these goals should be considered in the context of the overall strategic plan for the plant. Therefore, Oyster Creek is not committing to obtaining these targets." Exelon, as a corporation, has determined that they are not going to obtain all of the the "good practices" stated in the new revision. This determination was based on fact that these "good practice" recommendations are targets that plants may use in optimizing water chemistry that balances the conflicting requirements of materials, fuel and radiation control. An example of this this is the fact that too much FW zinc can be harmful to fuel, however beneficial for radiation field control. Oyster Creek establishes an optimum zinc program to protect the fuel as well as manage the radiation control. This is an example of not necessarily achieving all of the good practice goals, rather optimizing the total program.
The intent of the exception in question is to state that Oyster Creek is implementing BWRVIP-130 rather than BWRVIP-79. Exelon Corporation will implement the "good practices" that are applicable to each station and will be beneficial to the total water chemistry optimization program. All of the good practices are not applicable or achievable by Oyster Creek; therefore they are not able to meet all of the good practices recommended in BWRVIP-130.

(e.)Describe the current status of the OCGS Water Chemistry Program with respect to Hydrogen Water Chemistry (HWC), Noble Metal Chemical Application (NMCA), and Zinc Injection. Identify when these programs started and their impact on the operation of plant systems and the degradation of component materials.

HWC started 1992
- Model plant in the industry - this can be discussed further during the audit/interview.
- Model system design 99% range most of the time

NMCA started 2002
- See the May 2004 GE NM Coupon report which will be available during the audit.

Zinc Injection started 2000
- See the June 2004 Assessment and Recommendation report which will be available during the audit.
- There is an action item due in Oct 2005 to address any deviations that were identified.

NRC Information Request Form

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Rafferty-Czincila, Shannon	9/29/2005
Reviewed By:	Getz, Stu	10/11/2005
Approved By:	Warfel, Don	10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No		*Date Received:*	*Source*
AMP-043		9/21/2005	AMP Audit
Topic:		*Status:*	Closed
WATER CHEMISTRY			

Document References:
B.1.02

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.2 WATER CHEMISTRY(B.1.2-3) BWRVIP-62, Technical Basis for Inspection Relief for BWR Internal Components with Hydrogen Injection, and BWRVIP-75, Technical Basis for Revisions to Generic Letter 88-01 Inspection Schedules identify circumstances and conditions for which relief may be granted by the staff. The applicant is requested to describe all relief that has been granted by the staff for OCGS, based on these documents.

Assigned To: Rafferty-Czincila, Shannon

Response:

A review was performed and no relief requests were identified. This conclusion was confirmed via discussions with Greg Harttraft (system manager) and Mike Ford (chemistry).

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By:	Rafferty-Czincila, Shannon	9/29/2005
Reviewed By:	May, Mike	10/11/2005
Approved By:	Warfel, Don	10/11/2005

NRC Acceptance (Date): 10/ 5/2005

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-044		9/21/2005	AMP Audit
Topic:		***Status:***	Closed
WATER CHEMISTRY			

Document References:
B.1.02

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.2 WATER CHEMISTRY(B.1.2-4) Under Exceptions, the applicant states that the Oyster Creek program does not monitor for hydrogen peroxide because the rapid decomposition of hydrogen peroxide makes reliable data exceptionally difficult to obtain, and BWRVIP-130 Section 6.3.3, "Water Chemistry Guidelines for Power Operation," does not address monitoring for hydrogen peroxide. Hydrogen addition to feedwater has been applied in order to mitigate occurrence of IGSCC of structural materials by suppressing the formation of hydrogen peroxide. The hydrogen addition has accomplished an Electrochemical Corrosion Potential (ECP) value less than -230mV, SHE (Standard Hydrogen Electrode). By maintaining a low ECP less than -230mV, SHE, the reactor water chemistry minimizes the effects from hydrogen peroxide, below the threshold that prompted the issue raised in NUREG 1801.The staff notes that the ECP quantifies the oxidizing power of a solution in contact with a specific metal surface. The ECP of different reactor internals component materials is very sensitive to the concentration of oxygen, hydrogen, and hydrogen peroxide and therefore is different at different locations within the BWR reactor system. Section 5.3 of BWRVIP-79 discusses the potential locations suitable for measuring the ECP and Section 5.4 provides alternate ECP estimation techniques.In order to assist the staff in its evaluation of the exception, the applicant is requested to (a.)Clarify if the ECP is monitored at reactor locations shown in Fig. 5.5 of BWRVIP-79 for OCGS. Discuss the methods used and their frequency.(b.)Without periodically monitoring or estimating the ECP at some potential locations, discuss how one could ensure that hydrogen addition alone will maintain the ECP level at less than -230mV, SHE within the reactor system.

Assigned To: Rafferty-Czincila, Shannon

Response:

(a.)Clarify if the ECP is monitored at reactor locations shown in Fig. 5.5 of BWRVIP-79 for OCGS. Discuss the methods used and their frequency.
- OC monitors ECP directly with ECP probes in the B Recirculation Loop, via the RWCU system (Location E in Fig. 5.5 of BWRVIP-79.
- OC uses Rx dissolved Oxygen as a secondary parameter to ensure that mitigation is maintained in the recirculation loops. Rx Dissolved oxygen was the primary method of monitoring mitigation until NMCA was applied. Rx Dissolved Oxygen is monitored per CY-AB-120-100 Step 4.3.2.1and 4.3.3.2.A.

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(b.)Without periodically monitoring or estimating the ECP at some potential locations, discuss how one could ensure that hydrogen addition alone will maintain the ECP level at less than -230mV, SHE within the reactor system.
-Ref. CY-AB-120-1000 (a copy was supplied on 10/3/04) Section 5.3.1 for the Radiolysis Model Output (Feedwater ppm H2) Correlated to Hydrogen Benchmark. Oyster Creek uses the 4:1 Molar H2O2 model in Table 5-4.
-Per CY-AB-120-1000 Section 5.3.1.4.A States: "BWRVIP-118 and BWRVIP-62 both recommend that the hydrogen injection rate should be set to maintain a molar ratio of 3:1 at the location to be protected. For the Exelon BWR program this is defined as the upper downcomer." (Ref. BWRVIP-62 p.2, 2nd paragraph under "Background" & BWRVIP-118 Section 4.12 Bullet #8). The target injection rate for each BWR is given in Table 5-4 of CY-AB-120-1000, Molar Ratio 3:1, column titled Upper Downcomer. Oyster Creek maintains a conservative Molar Ratio of 4:1 (A copy of BWRVIP-118 was provided on 10/4/05).
-Monitoring the ECP of stainless steel exposed to reactor coolant in the recirculation line or at the RWCU inlet is the most direct means of assuring IGSCC mitigation of targeted components. The ECP is to be maintained below -230 mV (SHE). The measurement is to be made continuously. The noble metals surface loading also must be maintained above 0.1 micrograms/cm2 to assure protection.
-In summary, Exelon has chosen a strategy that uses ECP or the measured molar ratio of hydrogen to oxygen as the primary indicator of IGSCC mitigation with proof of sufficient catalyst loading. If ECP is unavailable, the measured molar ratio of hydrogen to oxygen can be used as an alternate indicator of protection.
-To assure that an adequate excess of hydrogen relative to oxygen is present to reduce the ECP below -230 mV (SHE) at target locations during power operation, the measured reactor water hydrogen to oxygen molar ratio will be maintained at greater than 3 at all plants during hydrogen injection. It also must be verified that a sufficient noble metals loading is present on targeted system surfaces. When ECP equipment is operational, a monitoring frequency of twice per year is sufficient for benchmarking purposes.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 10/ 6/2005

Reviewed By: Getz, Stu 10/11/2005

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-045

Date Received: 9/21/2005

Source AMP Audit

Topic:
WATER CHEMISTRY

Status: Closed

Document References:
B.1.02

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.2 (B.1.2-5) GALL indicates that the dissolved oxygen should be monitored for the feedwater, condensate, and CRD water. This also includes the torus, condensate storage tank, and spent fuel pool water. Consistent with the guidance provided in BWRVIP-130, condensate storage tank, demineralized water storage tank water, spent fuel pool water and torus water are not sampled for dissolved oxygen at OCGS. The Oyster Creek chemistry procedures require monitoring of conductivity, chlorides, sulfates and total organic carbon (TOC) in accordance with limits set by BWRVIP-130 as an alternate method for ensuring component integrity. The chlorides and sulfates levels determine the coolant conductivity while dissolved oxygen, hydrogen peroxide and hydrogen levels determine the coolant ECP. Please discuss how monitoring conductivity, chlorides, sulfates and total organic carbon (TOC) ensures the ECP levels in water associated with these primary and auxiliary systems and components, and explain how monitoring TOC level mitigates the aging effects due to the reactor component materials degradation.

Assigned To: Rafferty-Czincila, Shannon

Response:

Please discuss how monitoring conductivity, chlorides, sulfates and total organic carbon (TOC) ensures the ECP levels in water associated with these primary and auxiliary systems and components, and explain how monitoring TOC level mitigates the aging effects due to the reactor component materials degradation.
-Monitoring conductivity, chlorides, sulfates and total organic carbon (TOC) is not indicative of ECP levels in water associated with these primary and auxiliary systems and components.
- Because condensate storage tank, demineralized water storage tank water, spent fuel pool water and torus are open air systems, monitoring of dissolved oxygen is difficult and provides little input into component material monitoring. Therefore other parameters such as conductivity, chlorides, sulfates and total organic carbon (TOC) are monitored to ensure component material integrity.

-As stated above and in the LRA, the chlorides and sulfates levels determine the coolant conductivity while dissolved oxygen, hydrogen peroxide and hydrogen levels determine the coolant ECP.
-Additionally, monitoring dissolved oxygen and hydrogen levels are indications of ECP levels. For

example an increase in hydrogen levels will result in a decrease in ECP levels. Conversely an increase in dissolved oxygen levels will result in an increase in ECP levels.

Oyster Creek uses a method described in Section III of GEK-105918 (which was provided on 10/5/05) to calculate ECP and ensure that it is <-230 mV (SHE) as recommended in CY-AB-120-1000. A sample of the spreadsheet used to implement this method and perform the calculation was also provided on 10/5/05. Additionally OC uses a calculated hydrogen level, based on the HWC injection rate, along with the monitoring of dissolved oxygen to ensure that the molar ratio of hydrogen to oxygen is greater than 2:1 as recommended by BWRVIP-62 (p.2, 2nd paragraph under "Background") and BWRVIP-118 (Section 4.12 Bullet #8). A molar ratio greater than 2:1 ensures that there is excess hydrogen in the water therefore preventing any excess oxygen, which could be detrimental and cause your to increase above -230mV (SHE).

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 10/ 6/2005

Reviewed By: Getz, Stu 10/11/2005

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-046

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
WATER CHEMISTRY

Document References:
B.1.02

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.2 WATER CHEMISTRY(B.1.2-6): GALL requires that the water quality (i.e., pH and conductivity) is maintained in accordance with the EPRI Guidelines by periodically sampling for concentration of chemical species. The applicant states that the BWRVIP-130, Section 8.2.1.11, indicates that pH measurement accuracy in most BWR streams is generally suspect because of the dependence of the instrument reading on ionic strength of the sample solution. In addition, the monitoring of pH is not discussed in BWRVIP-130, Appendix B for condensate storage tank, demineralized water storage tank, or torus water. Therefore, at OCGS pH is not monitored for torus water, however pH is monitored in the CST & DWST. Alternate methods are applied to monitor the water chemistry of the torus in lieu of direct pH measurements.Please explain what other alternate methods are used to monitor the water quality of the torus, in lieu of direct pH measurements, and the technical basis for concluding that they are effective

Assigned To: Rafferty-Czincila, Shannon

Response:

- Oyster Creek monitors conductivity, chlorides, sulfates and total organic carbons (TOC) in the torus per BWRVIP-130 Table B-3 "Diagnostic Parameters for Torus/Pressure Suppression Pool" on p. B-4
- OC does not measure for pH in the torus. Table B-3 of the 2004 EPRI Guidelines defines diagnostic parameters to monitor in the torus, of which pH is not one of the parameters. However, this analysis has been performed occasionally and torus pH has been found to be near neutral (6.6-7.4). pH has been measured (with the corresponding values) in July 2001 (6.7), March 2002 (7.0), July 2003 (6.9) April 2005 (7.4) and June 2005 (6.6)

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 10/ 5/2005

NRC Information Request Form

Reviewed By: Getz, Stu 10/11/2005

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-047

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
WATER CHEMISTRY

Document References:
B.1.02

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

<u>Question</u>

B.1.2 WATER CHEMISTRY(B.1.2-7) The flow accelerated corrosion (FAC) in carbon and low alloy steel components is affected by the alloy composition, the pH at operating conditions, dissolved oxygen concentration, fluid bulk velocity, component geometry and upstream influences, fluid temperature and steam quality. The oxygen affects the form and solubility of the oxide layer, the dissolution of which is inherent in FAC. Section 3.4 of BWRVIP-79 states that the rate of FAC increases dramatically if oxygen concentration is less than about 25 ppb. In the feedwater and condensate system sometimes oxygen is injected to achieve this oxygen level.Please describe the OCGS procedures to maintain appropriate oxygen levels in water in various plant primary and secondary systems, including main steam, feedwater and condensate, to mitigate loss of material due to FAC (i.e., erosion/corrosion, steam cutting, etc.).

Assigned To: Rafferty-Czincila, Shannon

<u>Response:</u>

- CY-AB-120-110 "CONDENSATE AND FEEDWATER CHEMISTRY" is used to control oxygen levels in the feedwater and condensate systems. Table 1a: Feedwater (FW)/Condensate-Startup/Hot Standby/Hot Shutdown and Table 2a: Feedwater (FW)/Condensate-Power Operation provide action levels of >200 ppb and <30 >200 ppb, respetively, of oxygen in the FW and condensate systems.
- OC does not monitor main steam for Oxygen levels. Main Steam is generated from the reactor vessel water. Reactor water measures oxygen per CY-AB-120-100 Step 4.3.2.1and 4.3.3.2.A.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: Rafferty-Czincila, Shannon 10/ 5/2005

Reviewed By: Getz, Stu 10/11/2005

NRC Information Request Form

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

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Item No
AMP-048

Date Received: 9/21/2005

Source AMP Audit

Topic:
WATER CHEMISTRY

Status: Closed

Document References:
B.1.02

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.2 WATER CHEMISTRY(B.1.2-8) The BWRVIP-79 recommends in Section 4 that the reactor water iron level be monitored as a new diagnostic parameter and the feedwater copper level be monitored as one of the control parameter. Please confirm that OCGS water chemistry program includes monitoring of these parameters as stated in the BWRVIP-79 guidelines.

Assigned To: Rafferty-Czincila, Shannon

Response:

Please confirm that OCGS water chemistry program includes monitoring of these parameters as stated in the BWRVIP-79 guidelines.
-CY-AB-120-100 (Reactor Water Iron)
-CY-AB-120-110 (Feedwater Copper)
- These procedures were provided on 10/4/05.

Per 4.3.2.2 of CY-AB-120-100 Reactor water insoluable iron level is required to be less than 100 ppb.
Additionally, 4.3.3.2.a requires monitoring of iron monthly.
Per Table 2a of CY-AB-120-110 FW Total Copper is monitored weekly with a goal of < or equal to 0.05 ppb and an Action Level 1 of <30>200 ppb.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 10/ 5/2005

Reviewed By: Getz, Stu 10/11/2005

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

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Item No
AMP-049

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
WATER CHEMISTRY

Document References:
B.1.02

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.2 WATER CHEMISTRY(B.1.2-9) Aging of Standby Liquid Control (SBLC) system components not in the reactor coolant pressure boundary section of SBLC system relies on monitoring and control of SBLC makeup water chemistry. The makeup water is monitored in lieu of the storage tank, because the sodium pentaborate that is maintained in the storage tank would mask most of the chemistry parameters monitored. The effectiveness of the water chemistry program will be verified by a one-time inspection of the SBLC system as discussed in the One-Time Inspection aging management program. Please confirm that the One-Time Inspection program would include the SBLC pump casing, and the associated tank discharge piping and valve bodies in addition to the SBLC tank.

Assigned To: Rafferty-Czincila, Shannon

Response:

The One-Time Inspection Program, B.1.24, Basis States:
"This program is used confirm the effectiveness of the Water Chemistry program to manage the loss of material and crack initiation and growth aging effects in treated water, steam, boiler treated water, auxiliary steam, and sodium pentaborate environments."
Additionally,
"The One-Time Inspection program, B.1.24, will be used to verify the effectiveness of the Water Chemistry program, B.1.02, to manage the loss of material and stress corrosion cracking at susceptible locations for the following material/component combinations exposed to sodium pentaborate environment in the Standby Liquid Control System (Liquid Poison System).
- Stainless Steel - piping and fittings, tanks, thermowells, and valve bodies

Sample Population:
Aging of Standby Liquid Control System (Liquid Poison System) components exposed to a sodium pentaborate environment relies on the monitoring and control of Standby Liquid Control System (Liquid Poison System) makeup water chemistry. The makeup water is monitored in lieu of the liquid poison tank because the sodium pentaborate that is maintained in the liquid poison tank would mask most of the chemistry parameters. The selected sample for one-time inspections for loss of material

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and stress corrosion cracking will include:
- One (1) stainless steel sample. The one-time inspection will consist of thickness measurements and crack detection using nondestructive examination (UT). Since the Standby Liquid Control System (Liquid Poison System) is a standby system, any section of pipe containing sodium pentaborate represents a "worse-case location".

Stainless steel piping was selected because stainless steel piping components such as tanks, thermowells, and valve bodies are robust in construction when compared to pipe and may not have a defined wall thickness baseline to compare against one-time inspection thickness results."

The One-Time Inspection Program does not include inspection of the SBLC pump casing because the pumps are not exposed to the sodium pentaborate environment. Under normal conditions, only the Liquid Poison Tank and the Liquid Posin Pump suction line, including branches to the first stop valve, contain a sodium pentaborate internal environment (Ref. Standby Liquid Control System Summary of Aging Management Evaluation, Plant Specific Note 6).

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: Rafferty-Czincila, Shannon 9/27/2005

Reviewed By: Miller, Mark 10/11/2005

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-050

Date Received: 9/21/2005
Source AMP Audit

Status: Closed

Topic:
BWR FEEDWATER NOZZLE

Document References:
B.1.05

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.5 BWR FEEDWATER NOZZLE (B.1.5-1) Please make available at the audit in both hardcopy and electronic format the document(s) that compare the ten elements in OCGS AMP B.1.5 to the ten elements in NUREG-1801 for AMP XI.M5.

Assigned To: May, Mike

Response:

Both hardcopy and electronic format the of the document that compare the ten elements in OCGS AMP B.1.5 to the ten elements in NUREG-1801 for AMP XI.M5 will be provided at the audit.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: May, Mike 9/28/2005

Reviewed By: NA

Approved By: Warfel, Don 10/ 1/2005

NRC Acceptance (Date): 10/ 7/2005

NRC Information Request Form

Item No
AMP-051

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR FEEDWATER NOZZLE

Document References:
B.1.05

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.5 BWR FEEDWATER NOZZLE (B.1.5-2) Considering the relatively short time period remaining before OCGS enters the license renewal period, the staff expects that considerable progress has already been made in developing and formally documenting the implementing procedures required for new AMPs, and for significant enhancements to existing AMPs. In light of this, please address each of the following questions regarding the current status of implementing procedures for this AMP: (a) Please provide the status of the implementing procedures for enhancements to the existing BWR Feedwater Nozzle program. (b) Please provide the schedule for initiating enhancements to the existing BWR Feedwater Nozzle program. (c) Please provide a sample of an implementing procedure for enhancements to the existing BWR Feedwater Nozzle program. (d) Please provide the results of any enhanced inspections that have already been completed

Assigned To: May, Mike

Response:

(a) The inspection of the Feedwater nozzles is administered by the Oyster Creek ISI, which is implemented by the Oyster Creek ISI Program Plan OC-1. OC-1 has been marked up to reflect the enhancements discussed in Appendix B.1.5 of the LRA. The markup of OC-1 was provided at the audit.

(b) The inspection of the Feedwater nozzles was last performed in 2000. The next scheduled inspection will be performed in 2010 and will use the enhancements described in Appendix B1.5 of the LRA. The program will be revised to include these enhancements prior to the period of extended operation.

(c) A sample of the implementing procedure (OC-1) was provided at the audit.

(d) No enhanced inspections have been performed as of this time; consequently no inspection results are available.

LRCR #: ***LRA A.5 Commitment #:***

NRC Information Request Form

IR#:

Approvals:

Prepared By:	May, Mike	9/30/2005
Reviewed By:	Getz, Stu	10/11/2005
Approved By:	Warfel, Don	10/11/2005
NRC Acceptance (Date):	10/ 6/2005	

NRC Information Request Form

Item No
AMP-052

Date Received: 9/21/2005
Source AMP Audit

Topic:
BWR FEEDWATER NOZZLE

Status: Closed

Document References:
B.1.05

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.5 BWR FEEDWATER NOZZLE (B.1.5-3) Please make available at the audit a copy of NUREG-0619, BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking, November 1980.

Assigned To: May, Mike

Response:

A copy of NUREG-0619, BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking, November 1980 will be available at the audit.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: May, Mike 9/29/2005

Reviewed By: NA

Approved By: Warfel, Don 10/ 1/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-053

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR FEEDWATER NOZZLE

Document References:
B.1.05

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.5 BWR FEEDWATER NOZZLE (B.1.5-4) Cracks were found in the FW nozzles and repaired during late 1970s. Please provide details about the size and location of these cracks and their repairs.

Assigned To: May, Mike

Response:

As described in a letter to the NRC, dated July 8, 1992, in 1977 inspections of the feedwater nozzle were conducted using PT techniques. The initial inspections detected 54 unacceptable flaws distributed among all four nozzles. Following clad removal the inspections were repeated and revealed 12 smaller indications in three of the nozzles, as follows:

Nozzle Location	# of indications	Length
45 degrees	5	0.5 to 1.5 inches long
135	none	
225	4	0.5 to 3 inches long
315	3	0.25 to 1 inches long

These indications were ground out with pencil grinders and surface polished. Subsequent examinations of the feedwater nozzles since 1977 have not identified any new indications.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: May, Mike 9/29/2005

Reviewed By: Getz, Stu 10/ 5/2005

NRC Information Request Form

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-054

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR FEEDWATER NOZZLE

Document References:
B.1.05

NRC Representative Subudhi, Mano

AmerGen (Took Issue):

Question

B.1.5 BWR FEEDWATER NOZZLE (B.1.5-5): Please provide the details of the recommendations in GE report NE-523-A71-0594 that OCGS is planning to implement prior to entering the period of extended operation. Please specify the revision to this document. Please make available at the audit a copy of the GE report and the staff SER on this document.

Assigned To: May, Mike

Response:

The use of the BWRVIP licensing topical report, NE-523-A71-0594, Revision 1, is a recent enhancement for the feedwater nozzle inspection and not been fully implemented at Oyster Creek. A copy of this document was provided at the audit, as well as a copy of the NRC SER for this licensing topical report.
Specifically, the UT methodology recommended in this report will be used to inspect the nozzle. Standard Performance Demonstration Initiative (PDI) UT methodology will be employed that meets the requirements of Appendix VIII of ASME XI.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	May, Mike	9/29/2005
Reviewed By:	Getz, Stu	10/ 5/2005
Approved By:	Warfel, Don	10/ 6/2006

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-055

Date Received: 9/21/2005

Source AMP Audit

Topic:
FEEDWATER NOZZLE

Status: Accepted by NRC

Document References:
B.1.05

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.5 BWR FEEDWATER NOZZLE (B.1.5-6) Please discuss whether OCGS is planning to implement monitoring in the thermal sleeve bypass, to detect leakage due to degraded thermal sleeve seals and welds, during the period of extended operation.

Assigned To: May, Mike

Response:

While not required by NUREG-0619 the inspection of the feedwater and CRD nozzles includes a visual inspection of the sparger to nozzle interface to detect signs of bypass flow that would lead to degradation of the thermal sleeve. Inspections specified for the 17R outage feedwater sparger were identified in SP-1302-56-130, Rev1 as VT-3 for exposed surfaces of feedwater sparger, welds, flow holes, and attachments in accordance with the NDE procedure NDE-VIS-04, "Visual Examination for Reactor Vessel internals." A VT-3 exam of the entire feedwater sparger includes the center transition area in the nozzle. No sign of discoloring due to leakage flow was observed.

The 2004 CRD nozzle inspection report provided objective evidence that the CRD nozzle blend radius area was inspected for signs of bypass flow around the thermal sleeve. The report indicates no evidence of bypass leakage was found. The feedwater nozzle was also inspected for indications of thermal sleeve bypass flow. Again no indications of bypass flow were found; however the feedwater nozzle inspection reports did not explicitly discuss results for the thermal sleeve. A review of previous feedwater nozzle inspection reports did not record explicitly the results of the inspection for signs of bypass flow leakage. To ensure future inspections clearly describe the results of inspection for thermal sleeve bypass flow, the Oyster Creek BWR Vessel Internals program (B.1.9) will be enhanced to include and document the condition of the CRD and Feedwater Nozzle thermal sleeves. The Rx Internals program was selected for this enhancement, because the thermal sleeves are not pressure boundary components and are best treated as internal components. Table 3.1.2.1.5 will also be changed to reflect that the appropriate aging management program for thermal sleeves is the BWR Reactor Vessel Internals program, B.1.9.

LRCR #: 271 *LRA A.5 Commitment #:*

NRC Information Request Form

IR#:

Approvals:

Prepared By:	May, Mike	2/14/2006
Reviewed By:	Miller, Mark	2/15/2006
Approved By:	Warfel, Don	2/15/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-056

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR CONTROL ROD DRIVE RETURN LINE NOZZLE

Document References:
B.1.06

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.6 BWR CONTROL ROD DRIVE RETURN LINE NOZZLE (B.1.6-1) Please make available at the audit in both hardcopy and electronic format the document(s) that compare the ten elements in OCGS AMP B.1.2 to the ten elements in NUREG-1801 for AMP XI.M2.

Assigned To: May, Mike

Response:

Both hardcopy and electronic format the documents that compare the ten elements in OCGS AMP B.1.6 to the ten elements in NUREG-1801 for AMP XI.M6 will be provided at the audit.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: May, Mike 9/29/2005

Reviewed By: NA

Approved By: Warfel, Don 10/ 1/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-057

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR CONTROL ROD DRIVE RETURN LINE NOZZLE

Document References:
B.1.06

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.6 BWR CONTROL ROD DRIVE RETURN LINE NOZZLE B.1.6-2: Please make available at the audit a copy of the OCGS relief request and associated staff SER, allowing UT testing in lieu of PT, that form the basis for the stated exception to GALL.

Assigned To: May, Mike

Response:

A copy of the OCGS relief request and associated staff SER, allowing UT testing in lieu of PT will be provided at the audit.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: May, Mike 9/29/2005

Reviewed By: NA

Approved By: Warfel, Don 10/ 1/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-058

Date Received: 9/21/2005

Source AMP Audit

Status: Accepted by NRC

Topic:
BWR CONTROL ROD DRIVE RETURN LINE NOZZLE

Document References:
B.1.06

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.6 BWR CONTROL ROD DRIVE RETURN LINE NOZZLE B.1.6-3: GALL specifies that any detected crack be ground out. The applicant identifies an exception to this. Oyster Creek procedures allow a crack that is found unacceptable under IWB-3400 and IWB-3500 to be evaluated under ASME XI, IWB-3600 or repaired by an NRC approved procedure. Please provide technical justification for this exception, and also provide details of the NRC approved repair procedure.

Assigned To: May, Mike

Response:

NUREG-0619 required any cracks found during the initial NUREG-0619 inspections to be ground out, unless clad removal is performed. NUREG-0619 does not provide guidance if flaws are found in subsequent inspections. The NUREG-0619 inspections of the CRD RL nozzle in 1977 did find not any flaw indications. Subsequent inspections have not indicated any defects. Our procedures are compliance with ASME Section XI, which allow flaws to be evaluated in accordance with IWB-3400 and IWB-3500. Repairs are then performed in accordance with ASME Section XI, IWA-4000, if the flaw does not meet the requirements of IWB-3600.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: May, Mike 9/29/2005

Reviewed By: Getz, Stu 10/ 5/2005

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-059

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR CONTROL ROD DRIVE RETURN LINE NOZZLE

Document References:
B.1.06

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.6 BWR CONTROL ROD DRIVE RETURN LINE NOZZLE B.1.6-4: OCGS had cracks in these nozzles during 1979. To minimize thermal cycling and fatigue-induced cracking at these nozzles, OCGS has modified the thermal sleeve to divert the relatively cold CRD flow away from the nozzle. Please discuss the details of the nozzle cracking and the thermal sleeve modifications

Assigned To: May, Mike

Response:

The NUREG-0619 inspections of the CRD RL nozzle in 1977 did not find any flaw indications. The CRD RL thermal sleeve was replaced with a new design that directed flow further into the downcomer region and away from the nozzle wall. The new thermal sleeve is a 1 inch schedule 40 pipe that is attached to remaining portion of the removed thermal sleeve by an interference fit. The 1inch pipe increases fluid velocity to minimize the possibility of re-entry of hot recirculation flow back into the thermal sleeve. Additional design details will be available at the audit.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: May, Mike 9/30/2005

Reviewed By: Getz, Stu 10/ 5/2005

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No		*Date Received:*	*Source*
AMP-060		9/21/2005	AMP Audit
Topic:		*Status:*	Closed
BWR STRESS CORROSION CRACKING			

Document References:
B.1.07

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

__Question__

B.1.7 BWR STRESS CORROSION CRACKINGB.1.7-1: Please make available at the audit in both hardcopy and electronic format the documents) that compare the ten elements in OCGS AMP B.1.7 to the ten elements in NUREG-1801 for AMP XI.M7.

Assigned To: Rafferty-Czincila, Shannon

__Response:__

A copy will be provided during the audit.
- Copies provided on 10/3/05.

LRCR #: *LRA A.5 Commitment #:*

IR#:

__Approvals:__

Prepared By:	Rafferty-Czincila, Shannon	9/29/2005
Reviewed By:	Hufnagel, John	9/29/2005
Approved By:	Warfel, Don	10/ 6/2005

NRC Acceptance (Date): 10/ 5/2005

NRC Information Request Form

Item No
AMP-061

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR STRESS CORROSION CRACKING

Document References:
B.1.07

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.7 BWR STRESS CORROSION CRACKINGB.1.7-2: Please make available at the audit a copy of NUREG-0313, Rev. 2, Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping, 1988.

Assigned To: Rafferty-Czincila, Shannon

Response:

A copy will be provided during the audit.
- Copies provided on 10/3/05.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 9/29/2005

Reviewed By: Hufnagel, John 9/29/2005

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 5/2005

NRC Information Request Form

Item No
AMP-062

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR STRESS CORROSION CRACKING

Document References:
B.1.07

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.7 BWR STRESS CORROSION CRACKINGB.1.7-3: Please discuss the details of weld repairs and material replacement of components at OCGS to implement the NUREG recommendations

Assigned To: Rafferty-Czincila, Shannon

Response:

1) The following piping was replaced with IGSCC resistant material (low carbon stainless steel):
* All Isolation Condenser large bore piping outside the drywell (from the drywell penetrations to the isolation condensers) that has been susceptible to IGSCC. Additionally, all new welds were stress improved. This replacement reduced the number of susceptible welds.
* All piping within four (4) isolation condenser drywell penetrations and the two (2) RWCU system drywell penetrations which contain welds that are not inspectable.
* Isolation Condenser piping at the Isolation condensers on 95' elevation.
* Head Cooling Spray Nozzle Assembly, the 4 inch tee and flange of the reactor vent line

Additionally Oyster Creek stress improved all accessible/inspectable welds inside the drywell (except RWCU system).

2) Of the 380 welds in the GL 88-01 scope, including 85 in the RWCU system outside the second containment isolation valves, Oyster Creek had 11 welds in service with indications of IGSCC. Nine were repaired with full structural overlays (four in Core Spray, four in Recirculation and one in Shutdown Cooling). Two were in service without repair in the Recirculation system, however they were both stress improved before inspections found IGSCC. After the implementation of the NRC approved Performance Demonstration Initiative (PDI), inspections in 2002 and 2004 using this new technique determined that there were no indications of IGSCC in either of the Recirculation system welds. Therefore Oyster Creek currently does not have any indication of IGSCC.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Rafferty-Czincila, Shannon	9/29/2005
Reviewed By:	Harttraft, Greg	9/29/2005
Approved By:	Warfel, Don	10/11/2005
NRC Acceptance (Date):	10/ 5/2005	

NRC Information Request Form

Item No
AMP-063

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR STRESS CORROSION CRACKING

Document References:
B.1.07

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.7 BWR STRESS CORROSION CRACKINGB.1.7-4: Please discuss detected flaw indications and their evaluations/repairs after implementing the NUREG recommendations.

Assigned To: Rafferty-Czincila, Shannon

Response:

To date, IGSCC has been found in 40 welds. No new indications of cracking have been found during the last six (6) outages. Due to numerous piping replacements the 40 welds were reduced to 11 welds that were in service with indications of IGSCC. Nine of these were repaired with full structural overlays (four in Core Spray, four in Recirculation and one in Shutdown Cooling). Two are in service without repair in the Recirculation system, however they were both stress improved before inspections found IGSCC. However, after the implementation of the NRC approved Performance Demonstration Initiative (PDI), inspections in 2002 and 2004 using this new technique determined that there were no indications of IGSCC in either of the Recirculation system welds. Therefore Oyster Creek currently does not have any indication of IGSCC.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 9/29/2005

Reviewed By: Harttraft, Greg 9/29/2005

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 5/2005

NRC Information Request Form

Item No
AMP-064

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR PENETRATIONS

Document References:
B.1.08

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.8 BWR PENETRATIONSB.1.8-1: Please make available at the audit in both hardcopy and electronic format the documents) that compare the ten elements in OCGS AMP B.1.8 to the ten elements in NUREG-1801 for AMP XI.M8.

Assigned To: May, Mike

Response:

Response:

Both hardcopy and electronic format the documents that compare the ten elements in OCGS AMP B.1.8 to the ten elements in NUREG-1801 for AMP XI.M8 will be provided at the audit.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: May, Mike 9/30/2005

Reviewed By: NA

Approved By: Warfel, Don 10/ 1/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-065

Date Received: 9/21/2005

Source AMP Audit

Status: Closed

Topic:
BWR PENETRATIONS

Document References:
B.1.08

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.8 BWR PENETRATIONSB.1.8-2: GALL recommends BWRVIP-53 and 57 for repair guidelines. Please confirm that OCGS procedures follow these guidelines along with the inspection and evaluation guidelines of BWRVIP-49 and 27.

Assigned To: May, Mike

Response:

The inspections of the BWR penetrations follow the guideline of BWRVIP 27-A and BWRVIP-49-A as specified in the Oyster Creek reactor Internals program plan OC-5. Repairs for guidelines are governed by corporate procedure ER-AB-331-1001 which requires BWRVIP-53 and BWRVIP-57 to be followed for repairs of vessel penetrations.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: May, Mike 9/30/2005

Reviewed By: Getz, Stu 10/ 4/2005

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-066

Date Received: 9/21/2005

Source
AMP Audit

Status: Closed

Topic:
BWR PENETRATIONS

Document References:
B.1.08

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

__Question__

B.1.8 BWR PENETRATIONSB.1.8-3: GALL states that an applicant may use the guidelines of BWRVIP-62 for inspection relief for vessel internals with hydrogen water chemistry. Please discuss all relief requests granted by the staff, based on BWRVIP-62..1.8-3: GALL states that an applicant may use the guidelines of BWRVIP-62 for inspection relief for vessel internals with hydrogen water chemistry. Please discuss all relief requests granted by the staff, based on BWRVIP-62.

Assigned To: May, Mike

__Response:__

Oyster Creek has not used BWRVIP-62 to request relief for inspections of the BWR penetrations or other reactor internals components.

LRCR #: *LRA A.5 Commitment #:*

IR#:

__Approvals:__

Prepared By:	May, Mike	9/30/2005
Reviewed By:	Rafferty-Czincila, Shannon	10/11/2005
Approved By:	Warfel, Don	10/12/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No		*Date Received:*	*Source*
AMP-067		9/21/2005	AMP Audit
Topic:		*Status:*	Closed
BWR PENETRATIONS			

Document References:
B.1.08

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

__Question__

B.1.8 BWR PENETRATIONSB.1.8-4: GALL states that the NDE techniques appropriate for inspection, including the uncertainties, are included in BWRVIP-03. Please discuss NDE techniques suggested in this BWRVIP document that are used in the OCGS in-service inspection program.

Assigned To: May, Mike

__Response:__

The examination of the BWR vessel penetrations and other reactor internals meet the requirements of the appropriate BWRVIP guideline. The NDE techniques recommended by these guidelines and those used at OC meet the requirements of BWRVIP-03 where applicable. Compliance with BWRVIP-03 is required by the OC Reactor Internals Program plan and by corporate procedures ER-331-AB-331-1001.

LRCR #: *LRA A.5 Commitment #:*

IR#:

__Approvals:__

Prepared By:	May, Mike	9/30/2005
Reviewed By:	Getz, Stu	10/ 4/2005
Approved By:	Warfel, Don	10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-068		9/21/2005	AMP Audit
Topic:		***Status:***	Closed
BWR PENETRATIONS			

Document References:
B.1.08

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.8 BWR PENETRATIONS B.1.8-5: GALL recommends BWRVIP-14, 59, and 60 for crack growth evaluation guidelines for stainless steel, nickel alloys and low alloy steels, respectively. Please identify OCGS procedures that use these recommended guidelines, and make them available at the audit.

Assigned To: May, Mike

Response:

Flaw evaluation are governed by procedures that require compliance with the appropriate BWRVIP guideline or ASME requirement. Procedure ER-331-AB-331-1001 refers to BWRVIP-14, BWRVIP-59, and BWRVIP-60 for guidance in performing flaw evaluations.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	May, Mike	9/30/2005
Reviewed By:	Getz, Stu	10/ 5/2005
Approved By:	Warfel, Don	10/ 5/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-069

Date Received: 9/23/2005
Source AMP Audit
Status: Closed

Topic:
ASME Section XI, Subsection IWE

Document References:
B.1.27-1

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

The applicant is requested to identify the documents) that includes the evaluation of OCGS AMP B.1.27 against the program elements of GALL XI.S1, and to make it available in both electronic and hard-copy formats for the on-site AMP audit.

Assigned To: Ouaou, Ahmed

Response:

The 10-Element review for AMP B.1.27 ASME Section XI, Subsection IWE, is provided to the reviewer in hardcopy. An electronic copy is available to the reviewer.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 9/28/2005

Reviewed By: N/A

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-070

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
ASME Section XI, Subsection IWE

Document References:
B.1.27-2

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(B.1.27-2) :In the OCGS AMP B.1.27 discussion of operating experience, the applicant discusses three (3) areas where containment degradation has been observed. These are the upper region of the drywell shell; the sand bed region at the bottom of the drywell; and the suppression chamber (Torus) and vent system. Upper region of the drywell shell. The applicant refers to the LRA Section 4.7.2 Drywell Corrosion TLAA evaluation for further discussion. In LRA Section 4.7.2, the disposition of this TLAA is in accordance with 10 CFR 54.21(c)(1)(iii), and the Oyster Creek ASME Section XI, Subsection IWE aging management program is credited to address the drywell corrosion TLAA. In LRA Section 4.7.2, under Analysis, the applicant states that The Oyster Creek ASME Section XI, Subsection IWE aging management program (B.1.27) ensures that the reduction in vessel thickness will not adversely affect the ability of the drywell to perform its safety function. The ASME SectionXI, Subsection IWE aging management program:Performs Periodic UT inspections at critical locations,Performs calculations to track corrosion rates,Projects vessel thickness based on conservatives corrosion rates, andDemonstrates that the minimum required vessel thickness is maintained.Inspections conducted since 1992 demonstrate that as a result of corrective actions the corrosion rates are very low or in some cases have been arrested. The drywell surfaces that were coated do not show signs of or deterioration. Drywell vessel wall thickness measurements indicate there is substantial margin to the minimum wall thickness, even when projected to the year 2029 using conservative estimates of the corrosion rates. Continued assessment of the observed drywell vessel thickness ensures that timely action can be taken to correct degradation that could lead to loss of the intended function. Additional information is provided in Reference 4.8.21.Please provide the following information pertaining to the augmented scope of IWE, as described above:
(a) Please confirm that the stated activities are currently incorporated into and implemented as part of the existing IWE program.
(b) Please provide the IWE implementing procedures for these activities, preferably in both hard copy and electronic format.
(c) Please clarify the scope of these activities. Is the sand bed region, in addition to the upper region of the drywell shell, also included in the augmented scope? Are other locations regularly or randomly checked, to ensure that all degraded areas are known and monitored?
(d) Please provide the measured wall thickness history, the corrosion rate trending results, the projected remaining wall thickness at the end of the extended period of operation, and the CLB minimum required wall thickness for each location that is monitored.

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(e) Please identify the current frequency of augmented UT inspections, corrosion rate calculations, and end-of-operating life thickness calculations.
(f) Please identify the planned frequency of augmented UT inspections, corrosion rate calculations, and end-of-operating life thickness calculations for the extended period of operation.
(g) Please provide a copy of LRA Reference 4.8.21 at the on-site AMP audit.

Assigned To: Ouaou, Ahmed

Response:

a) OC was committed to the drywell corrosion program in 1986 before implementation of IWE in September 9, 2001. The program elements, including periodic UT inspections at critical locations, performing calculations to track corrosion rates, projecting vessel thickness based on conservative corrosion rates, and demonstrating that the minimum required vessel thickness is maintained are now incorporated into IWE as an augmented inspection.
b) Procedure ER-AA-330, ER-AA-330-007, OC-6, 2400-GMM-3900.52 are available in hardcopy and electronic copy. Spec IS-328227-004 is available in hardcopy
c) Examination of the drywell interior surfaces in the former sand bed region is included with IWE. Inspection of exterior surfaces of the drywell in the sand bed region is included in Protective Coatings and Monitoring Program (B.1.33).
d) A tabulation of measured thicknesses for the monitored elevation is provided to the reviewer. Calculation 1302-187-E310-0037, which summarizes trending results, projected remaining wall thickness at the end of the extended period of operation, and the CLB minimum required thickness is also provided to the reviewer.
e) UT inspections are performed every other refueling outage. Refer to calculation 1302-187-E310-0037 for corrosion calculation, and end-of-operating life thickness calculation.
f) Same as item e) above
g) Copy of reference 4.8.21, GPU Nuclear Corporation letter to NRC, dated September 15, 1995 is provided to the reviewer.

Note: References discussed above are included with response to question AMP-01

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 9/28/2005

Reviewed By: Muggleston, Kevin 1/ 6/2006

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-071		9/23/2005	AMP Audit
Topic:		***Status:***	Closed

ASME Section XI, Subsection IWE

Document References:

B.1.27-3

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(B.1.27-3):In the OCGS AMP B.1.27 discussion of operating experience, the applicant discusses three (3) areas where containment degradation has been observed. These are the upper region of the drywell shell; the sand bed region at the base of the drywell; and the suppression chamber (Torus) and vent system.Sand bed region at the bottom of the drywell - The applicant states that sand was removed and a protective coating was applied to the shell to mitigate further corrosion. The coating is monitored periodically under LRA AMP B.1.33 Protective Coating Monitoring and Maintenance Program. The reader is directed to program B.1.33 for additional details. LRA B.1.33 identifies this coating to be within its scope; the discussion of operating experience in LRA B.1.33 is similar to the discussion of operating experience in LRA B.1.27. Please provide the following information pertaining to aging management of the sand bed region:
(a) At the present time, is monitoring and maintenance of the coating in the sand bed region included in the scope of the current Protective Coating Monitoring and Maintenance Program or is it performed as part of the current IWE program?
(b) Please provide the implementing procedure for this activity, preferably in both hard copy and electronic format.
(c) Does LR aging management of the containment shell in the sand bed region include both the augmented IWE activities (as delineated in question B.1.27-2 above) and the coating monitoring and maintenance activities under B.1.33? If only B.1.33 is credited, please provide the technical basis for concluding that the augmented IWE activities are not necessary.

Assigned To: Ouaou, Ahmed

Response:

a) Monitoring and maintenance of the coating in the former sand bed region is included in the scope of the Protective Coating Monitoring and Maintenance Program (B.1.33)
b) The sand bed region coating is in accordance with specification SP-1302-32-035 and SP-9000-06-003. These documents are included with Program B.1.33.
c) The Protective Coating Monitoring and Maintenance Program is credited for aging management of the sand bed region. It is not included in augmented inspection required by IWE. As stated in IWE program (B.1.27) operating experience, corrective actions that include cleaning and coating of the

sand bed region implemented in 1992 have arrested corrosion. The coated surfaces were inspected in 1994, 1996, 2000, and 2004. The inspection showed no coating failure or signs or degradation. Thus, the region is not subject to augmented inspection in accordance with IWE-1240. The coating will be inspected every other refueling outage during the period of extended operation consistent with NRC commitments for the current term.

Oyster Creek will also perform periodic UT inspections of the drywell shell thickness in the sand bed region as described in response to NRC Questions AMP-141 and AMP-209.

Oyster Creek will also enhance the Protective Coating Monitoring and Maintenance Program (B.1.33) to require inspection of the coating credited for corrosion (Torus internal, vent system internal, sand bed region external) in accordance with ASME Section XI, Subsection IWE. For details of the enhancements refer to response to NRC Question AMP-188 for details.

Revised response to reference AMP-188, and AMP-209 which contain additional commitments and clarification discussed with NRC Staff on 1/26/2006.

LRCR #: 229 *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 2/ 5/2006

Reviewed By: Muggleston, Kevin 2/ 6/2006

Approved By: Warfel, Don 2/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-072

Date Received: 9/23/2005
Source AMP Audit
Status: Open

Topic:
ASME Section XI, Subsection IWE

Document References:
B.1.27-4

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

(B.1.27-4):In the OCGS AMP B.1.27 discussion of operating experience, the applicant discusses three (3) areas where containment degradation has been observed. These are the upper region of the drywell shell; the sand bed region at the base of the drywell; and the suppression chamber (Torus) and vent system.Suppression chamber (Torus) and vent system – The applicant states that the coating is inspected every outage and repaired, as required, to protect the torus shell and the vent system from corrosion, and refers the reader to program B.1.33 for additional details. Under operating experience in LRA B.1.33, the applicant states that Torus and vent header vapor space Service Level I coating inspections performed in 2002 found the coating in these areas to be in good condition. Inspection of the immersed coating in the Torus identified blistering. The blistering occurred primarily in the shell invert but was also noted on the upper shell near the water line. The majority of the blisters remained intact and continued to protect the base metal. However, several blistered areas included pitting damage where the blisters were fractured. A qualitative assessment of the identified pits was performed and concluded that the measured pit depths were significantly less than the established acceptance criteria. The fractured blisters were repaired to reestablish the protective coating barrier.Please provide the following information pertaining to past operating experience and LR aging management for the suppression chamber (Torus) and vent system:
(a) Please provide the plant documentation that describes the blistering and pitting, the qualitative assessment performed, the established acceptance criteria, and the corrective action taken, preferably in both hard copy and electronic format.
(b) Was ASME Section XI, Subsection IWE applied, to develop the acceptance criteria?
(c) Was the inspection that discovered the blistering and cracking conducted under IWE, a coatings monitoring and maintenance program, or another program? If another program, please identify the program.
(d) Are both the IWE and Coatings AMPs credited to manage loss of material due to corrosion for the suppression chamber (Torus) and vent system, for the extended period of operation? If not, please provide the technical basis for concluding that both AMPs do not need to be credited.

Assigned To: Ouaou, Ahmed

Response:

NRC Information Request Form

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By:

Reviewed By:

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-073		9/23/2005	AMP Audit
Topic:		***Status:***	Closed

RG 1.127, Inspection of Water-Control Structures

Document References:

B.1.32-1

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(B.1.32-1):The applicant is requested to identify the document(s) that includes the evaluation of the OC program against the program elements of GALL XI.S7, and to make it available in both electronic and hard-copy formats for the on-site AMP audit.

Assigned To: Ouaou, Ahmed

Response:

The 10-Element review for AMP B.1.32 RG 1.127, Inspection of Water-Control Structures Assoociated with Nuclear Power Plants, is provided to the reviewer in hardcopy. An electronic copy is available to the reviewer.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 9/27/2005

Reviewed By: N/A

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-074

Date Received: 9/23/2005

Source AMP Audit

Topic:
RG 1.127, Inspection of Water-Control Structures

Status: Closed

Document References:
B.1.32-2

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(B.1.32-2):Considering the relatively short time period remaining before OCGS enters the license renewal period, the staff expects that considerable progress has already been made in developing and formally documenting the implementing procedures required for new AMPs, and for significant enhancements to existing AMPs. In light of this, please address each of the following questions regarding the current status of implementing procedures for this AMP:
(a) Please provide the status of the implementing procedures for each enhancement to the existing RG 1.127, Inspection of Water-Control Structures program.
(b) Please provide the schedule for initiating each of the enhancements to the existing RG 1.127, Inspection of Water-Control Structures program.
(c) Please provide a sample of an implementing procedure for one enhancement to the existing RG 1.127, Inspection of Water-Control Structures program.
(d) Please provide the results of any enhanced inspections that have already been completed.

Assigned To: Ouaou, Ahmed

Response:

a) Enhancements to the implementing procedure, 125.6, are in progress and will be completed by 12/31/2006. A draft copy is available for review.
B) Plans are underway to schedule outage related inspections to be done during the upcoming 2006 refueling outage. Non-outage related activities will be completed by 12/31/2008.
C) Draft procedure 125.6 is available for review
d) Enhanced inspections have not yet been done

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 9/30/2005

NRC Information Request Form

Reviewed By: Getz, Stu 10/ 6/2005

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-075

Date Received: 9/23/2005

Source AMP Audit

Status: Accepted by NRC

Topic:
RG 1.127, Inspection of Water-Control Structures

Document References:
B.1.32-3

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(B.1.32-3):LRA Appendix B, Section B.0.5 identifies AMP B.1.32 as an existing program. The Program Description states that this AMP is part of the Structures Monitoring Program, and further states The program will be used to manage. The scope of the six enhancements listed for AMP B.1.32 encompass many of the elements that normally would be part of an existing inspection program for water-control structures. Consequently, the applicant is requested to
(a) specifically describe the scope of the currently existing program, including the structures and components in the scope of the existing program; the aging effects that are monitored; the inspection methods employed; and the inspection frequency; and
(b) specifically describe the scope of AMP B.1.32, including the structures and components in the scope of AMP B.1.32; the aging effects that are monitored; the inspection methods employed; and the inspection frequency.

Assigned To: Ouaou, Ahmed

Response:

a) RG 1.127, Inspection of Water-Control Structures is implemented through the Structures Monitoring Program, B.1.31. The scope of the program includes the Intake Structure and Canal, and the Dilution Structure. Components monitored include earthen control structures (intake canal, embankment) and reinforced concrete structures. The aging effects monitored include cracks, sinkholes, and embankment collapse of the intake canal embankment. Concrete structures are monitored for cracks, spalling and scaling, rebar exposure, rust stain, structural settlement, and rebar corrosion. The method of inspection is visual inspection. Inspection frequency of accessible areas is every 4 years. Inaccessible areas of the structures are inspected whenever an opportunity occurs.

b) The scope of the enhanced program includes structures and components that are in scope of the existing program. In addition, the scope is enhanced to include the Fire Pond Dam inspection, inspection of submerged components of the Intake Structure and Canal, the Dilution structure, the Fire Pond Dam, and the earthen dike between the Intake and the Discharge Canal. The aging effects monitored include cracks, sinkholes, and embankment collapse of the intake canal embankment. Concrete structures are monitored for cracks, spalling and scaling, rebar exposure, rust stain,

structural settlement, and rebar corrosion. Enhancement to the aging effects include the addition of monitoring concrete structures for change in material properties due to leaching of calcium hydroxide, inspection of wooden components for loss of material and change in material properties, and loss of material due to corrosion for steel components. The method of inspection is visual inspection. Inspection frequency of accessible areas is every 4 years. Inaccessible areas are inspected whenever an opportunity occurs.

The program will be enhanced to require performing a baseline inspection of submerged water control structures prior to entering the period of extended operation. A second inspection will be performed 6 years after this baseline inspection and a third 8 years after the second. After each inspection an evaluation will be performed to determine if the identified degradations warrant more frequent inspections or corrective actions. This constitutes a new enhancement not previously identified in the LRA (also see AMP-077)

LRCR #: 228 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 1/31/2006

Reviewed By: Getz, Stu 1/31/2006

Approved By: Warfel, Don 2/ 2/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-076

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
RG 1.127, Inspection of Water-Control Structures

Document References:
B.1.32-4

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(B.1.32-4):The first enhancement to B.1.32 identifies that the program will provide for monitoring of trash racks. In LRA Table 3.5.2.1.11, the Structures Monitoring Program is credited for aging management of trash racks. Please explain this apparent discrepancy.

Assigned To: Ouaou, Ahmed

Response:

The trash racks are not identified in NRC Regulatory Guide 1.127, Inspection or Water-Control Structures Associated with Nuclear Power Plants, as component of the water control structures. The CLB does not credit the trash racks for the safety related intended function of the Ultimate Heat Sink (UHS). However, we recognize that the trash racks provide a filter function that prevents debris from potentially clogging ESW pumps. For this reason, we included the trash racks in the scope of the Rule and credit the Structures Monitoring Program for managing their aging. Also as stated in Appendix B.1.32, RG 1.127, Inspection or Water-Control Structures Associated with Nuclear Power Plants, the program is implemented through the Structures Monitoring Program B.1.31. Thus the aging effects of the trash racks are monitored by the same program used to monitor water control structures.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 9/30/2005

Reviewed By: Muggleston, Kevin 1/ 6/2006

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-077

Date Received: 9/23/2005

Source
AMP Audit

Status: Accepted by NRC

Topic:
RG 1.127, Inspection of Water-Control Structures

Document References:
B.1.32-5

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(B.1.32-5):The Program Description for AMP B.1.32 states Inspection frequency is every four (4) years; except for submerged portions of the structures, which will be inspected when the structures are dewatered, or on a frequency not to exceed 10 years. GALL AMP XI.S7 identifies an inspection frequency of 5 years. Please explain why the 10 year inspection frequency is NOT identified as an exception to the GALL AMP. Please also provide the technical basis for concluding that a 10 year inspection frequency is sufficient for submerged portions of structures.

Assigned To: Ouaou, Ahmed

Response:

The 5 year inspection frequency identified in GALL AMP XI.S7 is based on Regulatory Guide 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants. Oyster Creek is not committed to inspect underwater structures on a frequency of 5 years as explained below. The Oyster Creek RG 1.127, Inspection of Water Control Structures Associated with Nuclear Power Plants was reviewed by NRC and approved the program. For this reason the 10 year frequency was not identified as an exception to the GALL AMP.

The Oyster Creek original design did not commit to the requirements of RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants. However in response to NUREG-0822, Integrated Plant Safety Assessment Systematic Evaluation Program (SEP) Topic III-3.C, Oyster Creek evaluated water control structures consistent with the requirements of RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants, and presented to the NRC the evaluation results and the proposed Oyster Creek RG. 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants surveillance program. In a letter dated June 24, 1982, the NRC provided the results of its review and comments on the proposed surveillance program This letter and NUREG-1382, Safety Evaluation Report related to the full-term operating license for Oyster Creek Nuclear Generating Station formed the basis for the existing Oyster Creek RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants aging management program.

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The existing Oyster Creek RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants aging management program did not commit to the inspection frequency of 5 years specified in Regulatory Guide 1.127 revision 1. Inspection of water control structures is included in the Oyster Creek Structures Monitoring Program (B.1.31); except for the Fire Pond Dam, which is inspected under the New Jersey Dam Safety Standards, N.J.A.C 7:20-1.1 et seq.

The Oyster Creek Structures Monitoring Program (B.1.31) requires inspection of accessible water control structures on a 4 year frequency consistent with the frequency for implementing the requirements of the 10 CFR Part 50.65, Maintenance Rule. The program considers underwater structures inaccessible and requires inspection only when they become accessible. For license renewal, we enhanced the program to require inspection of underwater structures before entering the period of extended operation, and on a frequency of 10 years during the period of extended operation. After each inspection, the identified degradations will be evaluated to determine if more frequent inspections are warranted to ensure that the intended function of the water control structures is not adversely impacted. The 10 year frequency is selected based on plant operating experience with the Intake Structure and Canal. This operating experience identified concrete degradations, however none were significant enough to impact the intended function of the structure.

The above information was presented to the NRC Staff during the AMP audit week. The Staff indicated that it has a concern that the Oyster Creek operating experience may not be sufficient to conclude with reasonable assurance the 10 year frequency is adequate to detect aging effects before an intended function is impacted. As a result of the Staff's concern, Oyster Creek agreed to perform 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.

LRCR #: 228 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 12/20/2005

Reviewed By: Quintenz, Tom 12/20/2005

Approved By: Warfel, Don 12/21/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-078

Date Received: 9/23/2005

Source AMP Audit

Topic:
RG 1.127, Inspection of Water-Control Structures

Status: Closed

Document References:
B.1.32-6

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(B.1.32-6):Per the Operating Experience discussion for B.1.32, OCGS has experienced (1) degradation of the Intake Structure concrete that required repair in the 1980s; (2) cracking and spalling of Intake Structure and Dilution Structure concrete identified in 2002; and (3) degradation of the intake canal identified in 2001. The 2 recent findings were dispositioned as acceptable, because the intended functions had not been impacted. For all three occurrences, please provide the plant documentation that describes the degradation, the assessment performed, the acceptance criteria applied, future monitoring recommendations, and any corrective action taken.

Assigned To: Ouaou, Ahmed

Response:

The requested documentation is included in Oyster Creek RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants Program Basis Document (PBD-AMP-B.1.32) Notebook and will be available for Staff's review during the AMP audit week.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 12/20/2005

Reviewed By: N/A

Approved By: Warfel, Don 1/ 4/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-079

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
Open-Cycle Cooling Water System

Document References:
B.1.13

NRC Representative Villaran, Mike

AmerGen (Took Issue):

<u>Question</u>

LRA AMP B.1.13 Open Cycle Cooling Water (OCCW)Note: It is preferred that requested documents be provided in both hard copy and searchable (e.g., searchable Adobe pdf, Word, or Word Perfect) electronic file formats
1. Please provide plant-specific system training documents (e.g., system training manuals) for each system that credits the OCCW Aging Management Program
2. Please make available at the audit, in both hard copy and electronic format, the document(s) that compare the ten elements in OCCW AMP B.1.13 to the ten elements in AMP XI.M20 of NUREG-1801.
3. Please address each of the following questions regarding the current status of implementing procedures for this AMP:
(a) Please provide the status of the implementing procedures for each enhancement to the existing program
(b) Please provide the schedule for initiating each of the enhancements to the existing program
(c) Please provide a sample of an implementing procedure for one enhancement to the existing program
(d) Please provide the results of any enhanced inspections that have already been completed.
4. The License Renewal Open Cycle Cooling Water System Program and the plant specific Generic Letter 89-13 Program are related, but different, programs. The scope of the GL 89-13 Program is typically based on plant-specific licensing commitments to GL 89-13. The License Renewal Open Cycle Cooling Water System Program has a broader scope than the GL 89-13 program, since it includes non safety-related components meeting the requirements of 10 CFR 54.4(a)(2). For example, the OCCW AMP typically includes non safety-related piping that is outside the scope of the GL 89-13 program.□With regard to the above:
- Please provide your response and licensing basis commitments to Generic Letter 89-13.
- Please describe the difference in scope between the Oyster Creek Generic Letter 89-13 Program and the License Renewal Open Cycle Cooling Water System Aging Management Program (AMP).
- Please provide procedures / program documents that have been developed to extend the implementation of GL 89-13 recommendations to systems and components within the scope of the OCCW AMP.
- Please provide documentation that demonstrates compliance of the OCCW AMP to the Oyster Creek response to GL 89-13.

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5. Please provide the results of the operating history review performed to demonstrate the effectiveness of the OCCW system program in identifying and mitigating leaks, as well as preventing equipment failures related to fouling and flow blockage.
6. LRA AMP B.1.13 states that the aboveground inspection locations are representative of the same internal coatings, environments and aging effects present in the buried sections of the ESW and SW system piping. Please provide the technical basis for this determination.
7. In its discussion of operating experience, AMP B.1.13 states that in 2004, 50% of the buried ESW piping and 10% of the buried SW piping was replaced with new pipe and an improved coating system. In addition, a plan is in place to replace the other 50% of the buried ESW piping prior to 2007. Please provide additional information that describes the circumstances and conditions that led to these modifications, and the technical rationale for determining the extent of buried piping replacements for each system (e.g., 100% of buried ESW piping vs.10% of buried SW piping).
8. Please provide Topical Report 140 - ESW and Service Water System Plan".
9. As discussed above, the scope of the GALL OCCW AMP includes non safety-related piping that is typically outside the scope of a GL 89-13 program. From a review of the operating history discussion presented in AMP B.1.13, it is not clear if the operability assessment performed in 2003 bounded the scope of the GALL AMP. Please clarify.
10. LRA AMP B.1.13 states that the OCCW AMP is consistent with GALL (NUREG-1801) without exceptions. GALL Element 5 for this AMP states that program testing and inspections are performed annually and during refueling outages. The inspection intervals specified in LRA AMP B.1.13 differ from those specified in NUREG-1801. This appears to be an exception to GALL. Please clarify.

Assigned To: Rafferty-Czincila, Shannon

Response:

1. *Please provide plant-specific system training documents (e.g., system training manuals) for each system that credits the OCCW Aging Management Program*
-The following documents were provided to Ken Sullivan 10/3/05:
OC Operator Training Packages for Containment Spray/ ESW, Fire Protection, RBCWW, Service Water System, Service Air and TBCCW

2. Please make available at the audit, in both hard copy and electronic format, the document(s) that compare the ten elements in OCCW AMP B.1.13 to the ten elements in AMP XI.M20 of NUREG-1801.
- Copies were provided on 10/3/05.

3. Please address each of the following questions regarding the current status of implementing procedures for this AMP:
(a) Please provide the status of the implementing procedures for each enhancement to the existing program
- Implementing procedures for enhancements to program B.1.13 have been identified, and all are in draft form. None are complete as of this time.

(b) Please provide the schedule for initiating each of the enhancements to the existing program

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- Enhancements to the B.1.13 program for Open Cycle Cooling Water Program are to be implemented prior to the period of extended operation.

(c) Please provide a sample of an implementing procedure for one enhancement to the existing program
- A draft sample of an implementing procedure for an enhancement to the existing OCCW program will be provided for the AMP audit.

(d) Please provide the results of any enhanced inspections that have already been completed.
- No enhanced inspections have been performed as of this time; consequently no inspection results are available.

4. The License Renewal Open Cycle Cooling Water System Program and the plant specific Generic Letter 89-13 Program are related, but different, programs. The scope of the GL 89-13 Program is typically based on plant-specific licensing commitments to GL 89-13. The License Renewal Open Cycle Cooling Water System Program has a broader scope than the GL 89-13 program, since it includes non safety-related components meeting the requirements of 10 CFR 54.4(a)(2). For example, the OCCW AMP typically includes non safety-related piping that is outside the scope of the GL 89-13 program.
With regard to the above:
- Please provide your response and licensing basis commitments to Generic Letter 89-13.
  - A copy will be provided during the audit.
  - A copy was provided on 10/3/05.

- Please describe the difference in scope between the Oyster Creek Generic Letter 89-13 Program and the License Renewal Open Cycle Cooling Water System Aging Management Program (AMP).
  - The Oyster Creek GL 89-13 Program includes the ESW system and the Containment Spray Heat Exchangers.
  - The OCCW AMP includes the ESW & SW system and the RBCCW, TBCCW and Containment Spray Heat Exchangers.

- Please provide procedures / program documents that have been developed to extend the implementation of GL 89-13 recommendations to systems and components within the scope of the OCCW AMP.
  - A copy of the identified implementing procedures will be provided during the audit. Some of the procedures have been drafted; some have not. None are complete at this time.

- Please provide documentation that demonstrates compliance of the OCCW AMP to the Oyster Creek response to GL 89-13.
  - The implementing procedures and the LRA provide the documentation that the OCCW AMP meets the requirements of the OC response to GL 89-13.

5. Please provide the results of the operating history review performed to demonstrate the effectiveness of the OCCW system program in identifying and mitigating leaks, as well as preventing equipment failures related to fouling and flow blockage.

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- The review of the ESW & SW system operating history was performed by reviewing TR-116, TDR-829 and the ESW operability evaluation that was performed in 2003. This gave an adequate summary of the results of the system's operating history. These documents will be available during the audit.
- For the RBCCW & TBCCW Heat exchangers, a review was performed of the CREM (work order completion remarks) for the inspection work orders. Material buildup were discovered during the inspections however there were no equipment failures due to flow blockage or fouling. The monitoring of the heat exchanger differential pressure by operations when the systems are in service has allowed cleaning of the heat exchangers prior to equipment failures related of fouling and flow blockage.

6. LRA AMP B.1.13 states that the aboveground inspection locations are representative of the same internal coatings, environments and aging effects present in the buried sections of the ESW and SW system piping. Please provide the technical basis for this determination.
- In 1992, the SWS piping developed a leak that resulted from failure of the external coating. The root cause evaluation determined that the piping failed due to improper application of the original coating. To date, there have been no other buried pipe leaks due to external degradation. Although other failures of buried piping have occurred, these buried piping leaks were determined to have originated from the inside of the buried piping.
- Throughout the period of extended operation, aging effects on underground, buried piping at Oyster Creek will be monitored through two aging management programs. The Buried Piping Inspection aging management program includes preventive measures to mitigate corrosion and periodic inspection of external surfaces for loss of material to manage the effects of corrosion on the pressure-retaining capacity of piping and components in a soil (external) environment. Preventive measures are in accordance with standard industry practices for maintaining external coatings and wrappings. In addition, underground piping at Oyster Creek is assessed through the Open Cycle Cooling Water aging management program, which monitors internal surfaces of the piping. The aboveground inspection locations that are included in the Open Cycle Cooling Water aging management program are representative of the same internal coatings, environments and aging effects present in the buried sections of piping subject to monitoring activities because the buried pipe is the same material and coatings and is exposed to the same raw water/salt water environment that the above ground piping is.

7. In its discussion of operating experience, AMP B.1.13 states that in 2004, 50% of the buried ESW piping and 10% of the buried SW piping was replaced with new pipe and an improved coating system. In addition, a plan is in place to replace the other 50% of the buried ESW piping prior to 2007. Please provide additional information that describes the circumstances and conditions that led to these modifications, and the technical rationale for determining the extent of buried piping replacements for each system (e.g., 100% of buried ESW piping vs.10% of buried SW piping).
- The ESW and Service Water Systems are experiencing piping pinhole leaks due to coating degradation. Since 1992, this mechanism has created an average of 1.3 leaks per year on underground and aboveground sections of these systems. Total repair costs have been in excess of 7.9 million dollars. This has led to the evaluation discussed below and the modifications planned for

the future.
- A risk versus consequence analysis of the ESW and Service Water Systems has been performed and updated. Each system was separated into segments based on location, depth, and radiological exposure. Based on operating experience, each segment was then assigned a high, medium or low risk value for the potential of a leak. Each segment was also assigned a high, medium or low consequence value based on: ability to detect the leak, accessibility to inspect and repair the leak, radiological conditions, potential for plant shutdown, and Nuclear Safety. Inspections, repairs and modifications are then planned based on the resulting risk and consequence values consistent with the above goals
- The complete detail of this analysis is performed in the Topical Report 140, which is provided at the request of question #8 below.

8. Please provide Topical Report 140 - "ESW and Service Water System Plan".
- A copy will be provided during the audit

9. As discussed above, the scope of the GALL OCCW AMP includes non safety-related piping that is typically outside the scope of a GL 89-13 program. From a review of the operating history discussion presented in AMP B.1.13, it is not clear if the operability assessment performed in 2003 bounded the scope of the GALL AMP. Please clarify.
- The operability assessment performed in 2003 was only applicable to the ESW system (the GL 89-13 applicable system)

10. LRA AMP B.1.13 states that the OCCW AMP is consistent with GALL (NUREG-1801) without exceptions. GALL Element 5 for this AMP states that program testing and inspections are performed annually and during refueling outages. The inspection intervals specified in LRA AMP B.1.13 differ from those specified in NUREG-1801. This appears to be an exception to GALL. Please clarify
- GALL Item 5 States: "Inspection scope, method (e.g., visual or nondestructive examination [NDE]), and testing frequencies are in accordance with the utility commitments under NRC GL 89-13. Testing and inspections are done annually and during refueling outages. Inspections or nondestructive testing will determine the extent of biofouling, the condition of the surface coating, the magnitude of localized pitting, and the amount of MIC, if applicable. Heat transfer testing results are documented in plant test procedures and are trended and reviewed by the appropriate group."
- The Scope of the OCCW AMP is: ESW & Service Water systems, TBCCW, RBCCW & Containment Spray heat exchangers
- TBCCW & RBCCW Htxr's are inspected annually. (PM00120M, PM00184M & PM00209M PM00189M)
- Operations monitors' differential pressure across the TBCCW & RBCCW heat exchangers when the systems are in service via OC procedures 309.1 and 322, respectively. The procedures state that cleaning of the heat exchangers is to be scheduled if the differential pressure exceeds the set limit. This, along with the annual cleaning, ensures adequate heat transfer capability.
- ESW Heat Exchangers are heat transfer tested annually. (PM241041 and PM241051)
- ESW Heat Exchangers inspections are performed every 3 yrs (PM00116M & PM00118M)
- ESW & SW System testing is performed quarterly. During this IST Pump test, flow and system parameters are measured and trended.
- ESW Pipe UT inspections - Committed every 2 yrs old, 4 yrs new pipe

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- SW Pipe UT inspections - Committed every 2 yrs old, 4 yrs new pipe

Based on the above schedules the OCCW heat exchangers are all either tested or inspected every year to ensure heat transfer capability. Additionally the ESW and SW systems are performance tested quarterly to ensure that the service water system will perform its intended function. Therefore each system in scope of the OCCW AMP are tested and/or inspected, as applicable, annually.

ALL OF THE ABOVE QUESTIONS WERE REVIEWED WITH KEN SULLIVAN DURING THE ADUIT INTERVIEW PROCESS. THERE WERE NOT FURTHER COMMENTS AT THAT TIME.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 9/28/2005

Reviewed By: Miller, Mark 10/ 5/2005

Approved By: Warfel, Don 1/ 3/2006

NRC Acceptance (Date): 1/27/2006

NRC Information Request Form

Item No
AMP-080

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
Closed-Cycle Cooling Water System

Document References:
B.1.14

NRC Representative Villaran, Mike

AmerGen (Took Issue):

Question

LRA AMP B.1.14 Closed Cycle Cooling Water (CCCW)Note: It is preferred that requested documents be provided in both hard copy and searchable (e.g., searchable Adobe pdf, Word, or Word Perfect) electronic file formats.
1.Please provide plant-specific system training documents (e.g., system training manuals) for each system that credits the CCCW Aging Management Program
2.Please make available at the audit, in both hard copy and electronic format, the document(s) that compare the ten elements in CCCW AMP B.1.14 to the ten elements in AMP XI.M21 of NUREG-1801.
3.For the Closed-cycle Cooling Water System (CCCW), NUREG 1801 refers to EPRI TR-107396 Closed Cooling Water Chemistry Guidelines. Per LRA AMP B.1.14, an exception is necessary because Oyster Creek implements the guidance provided in EPRI 1007820 Closed Cooling Water Chemistry Guideline, Revision 1. LRA AMP B.1.14 states that the only difference between the two guidelines is that the new revision provides more prescriptive guidance and has a more conservative monitoring approach. Please provide the results of the evaluation performed to support this conclusion.
4.Please describe evaluations (e.g. physical inspection, chemical analysis) that have been performed to identify existing or potential corrosion-related problems within the systems that credit the CCCW AMP.

Assigned To: Rafferty-Czincila, Shannon

Response:

1.Please provide plant-specific system training documents (e.g., system training manuals) for each system that credits the CCCW Aging Management Program
- The following documents were provided to Ken Sullivan on 10/3/05:
OC Operator Training Packages for Containment Spray/ ESW, Fire Protection, RBCWW, Service Water System, Service Air and TBCCW.

2.Please make available at the audit, in both hard copy and electronic format, the document(s) that compare the ten elements in CCCW AMP B.1.14 to the ten elements in AMP XI.M21 of NUREG-1801.
- A copy will be provided during the audit.

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- Copies were provided on 10/3/05.

3.For the Closed-cycle Cooling Water System (CCCW), NUREG 1801 refers to EPRI TR-107396 "Closed Cooling Water Chemistry Guidelines." Per LRA AMP B.1.14, an exception is necessary because Oyster Creek implements the guidance provided in EPRI 1007820 "Closed Cooling Water Chemistry Guideline", Revision 1. LRA AMP B.1.14 states that the only difference between the two guidelines is that the new revision provides more prescriptive guidance and has a more conservative monitoring approach. Please provide the results of the evaluation performed to support this conclusion.

- There were extensive changes made from Rev. 0 to Rev. 1 of this document. It would be best to discuss the differences during the 2 hour interview that is scheduled.

- THESE CHANGES WERE DISCUSSED DURING THE SCHEDULED AUDIT INTERVIEW. THERE WERE NO FURTHER QUESTIONS AT THAT TIME.

NUREG 1801 refers to EPRI TR-107396 Closed Cooling Water Chemistry Guidelines 1997 Revision. Oyster Creek implements the guidance provided in EPRI 1007820 "Closed Cooling Water Chemistry Guideline, Revision 1" which is the 2004 Revision to TR-107396. EPRI periodically updates industry water chemistry guidelines, as new information becomes available. Oyster Creek has reviewed EPRI 1007820 and has determined that the most significant difference is that the new revision provides more prescriptive guidance and has a more conservative monitoring approach. EPRI 1007820 meets the same requirements of EPRI TR-107396 for maintaining conditions to minimize corrosion and microbiological growth in closed cooling water systems for effectively mitigating aging effects. Below are the Montioring and Diagnostic Parameters required by EPRI 1007820 for the RBCCW, TBCCW and EDGCCW systems. These are inline with Exelon Corporate Procedures.

Systems with Nitrite Inhibitor (EDGCCW) have the following Control Program:
Nitrite: 600-1500 ppm - Action Level 1: <500 ppm , Action Level 2: <300 or >4000 ppm - Monthly or as Operated
pH: 9.0 to 10.5 - Action Level 1: <8.5 or >11.0, Action Level 2: <8.0 or >11.5 - Monthly or as Operated
Azole: 10 to 100 ppm azole - Action Level 1: <5 ppm, Action Level 2: <3 ppm - Monthly or as Operated
Chloride & Fluoride: < or equal to 8 ppm Cl, < or equal to 8 ppm F - Action Level 2: >10 ppm - Monthly or as Operated

Systems with Nitrite Inhibitor (EDGCCW) Diagnostic Parameters:
Conductivity - Consistent with Nitrite Level and Evaluate Trend - Monthly or as Operated
Nitrate - Evaluate Trend - Quarterly or as Operated
Ammonia - Evaluate Trend - Quarterly
Chloride & Sulfate - Evaluate Trend - Monthly or as Operated
Total Iron, Total Copper - Evaluate Trend - Monthly or as Operated
Microbiological - <104 CFU/ml or <1 ng/ml Microbial - Adenosine Triphosphate (ATP) - Monthly or as Operated
Isotopic Activity - Evaluate Trend - Quarterly or as Operated

Systems with Molybdate Inhibitor (RBCCW & TBCCW) have the following Control Program:

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Molybdate: 250 -1000 ppm as MoO4- Action Level 1: <200 ppm, Action Level 2: <160 - Weekly
pH: 9.2 to 10.8 - Action Level 1: <9.0 or >11.0, Action Level 2: <8.5 or >11.5 - Weekly
Azole: 10 to 100 ppm as TTA - Action Level 1: <5 ppm, Action Level 2: <3 ppm - Monthly
Chloride & Fluoride: < or equal to 8 ppm Cl, < or equal to 8 ppm F - Action Level 2: >10 ppm - Monthly

Systems with Molybdate Inhibitor (RBCCW & TBCCW) Diagnostic Parameters:
Conductivity - Evaluate Trend - Weekly
Chloride & Sulfate - Evaluate Trend - Monthly
Iron & Copper - Evaluate Trend - Monthly
Microbiological - <104 CFU/ml or <1 ng/ml Microbial - ATP - Quarterly
Isotopic Activity - Evaluate Trend - Quarterly

4.Please describe evaluations (e.g. physical inspection, chemical analysis) that have been performed to identify existing or potential corrosion-related problems within the systems that credit the CCCW AMP.
- A review of the implementing procedures can be done during the scheduled interview.
- A review of the inspections was performed during the audit. THERE WERE NO FURTHER QUESTIONS AT THAT TIME.
- The aging management program monitors the effects of corrosion and SCC by system surveillance testing and component inspections in accordance with guidance in EPRI 1007820 to evaluate system and component condition. (Reference: 309.1.1, 341, 642.4.001, 636.4.003, 636.4.013, PM00120M, PM00184M, PM00189M and PM00209M)
- If a chemistry parameter limits are exceeded, the chemistry control procedures require that corrective action be taken to restore parameters within the acceptable range. CCW Action Level 1 conditions are those that can be addressed using the 12-week work schedule concept, with no discernable increases in corrosion rates or impact on system efficiency. CCW Action Level 1 denotes a condition where system chemistry Control Parameters are outside the normal operating levels (Goal range). The recommended action is to increase monitoring frequency, as appropriate, and return the parameter to within the prescribed Goal range within 90 days. If the parameter has not returned to the normal operating range within 90 days, CCW Action Level 2 is entered. CCW Action Level 2 communicates a more serious condition, requiring action outside the normal 12-week work schedule. Values exceeding the CCW Action Level 2 threshold could initiate short-term system materials degradation. The recommended action is to return the parameter to within the prescribed Goal range within thirty (30) days. If after 30 days in CCW Action Level 2 the parameter has not returned to the normal range, and system operation is to continue, then a risk assessment (engineering evaluation) shall be performed indicating that the out of control parameter will not impact the long term reliability of the system. . (Reference: CY-AA-120-400)
** A COPY OF THE ABOVE REFERENCED DOCUMENTS WERE PROVIDED AND DISCUSSED DURING THE AUDIT.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

NRC Information Request Form

Approvals:

Prepared By:	Rafferty-Czincila, Shannon	10/ 4/2005
Reviewed By:	Miller, Mark	10/ 6/2005
Approved By:	Warfel, Don	1/ 5/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		*Date Received:*	*Source*
AMP-081		9/23/2005	AMP Audit
Topic:		*Status:*	Closed

Compressed Air Monitoring

Document References:

B.1.17

NRC Representative Villaran, Mike

AmerGen (Took Issue):

Question

LRA AMP B.1.17 Compressed Air Monitoring (CAM)Note: It is preferred that requested documents be provided in both hard copy and searchable (e.g., searchable Adobe pdf, Word, or Word Perfect) electronic file formats.
1.Please provide plant-specific system training documents (e.g., system training manuals) for each system that credits the CAM Aging Management Program
2. Please make available at the audit, in both hard copy and electronic format, the document(s) that compare the ten elements in CAM AMP B.1.17 to the ten elements in AMP XI.M24 of NUREG-1801.
3.Please provide your response and licensing basis commitments to Generic Letter 88-14, Instrument Air Supply Problems.

Assigned To: Micklo, Charles

Response:

All the following will be made available in hardcopy. The training course information and 10 element review are also provided in electronic searchable forms.

1. The Instrument Air system is the only system that utilizes AMP B.1.17 Compressed Air Monitoring. Operator training course is 828.0.0043 Rev 8 (Service, Instrument and Breathing Air).
2. B.1.17, the 10 element comparison of the Oyster Creek Compressed Air Monitoring.
3. The Oyster Creek Generic Letter 88-14 initial response is dated February 21, 1989 and followup response is dated March 9, 1992. NRC letter for GL 88-14 is dated Aug 8, 1988.
Oyster Creek performs periodic air quality sampling and component leak tests.

- Copies were provided on 10/3/05.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Micklo, Charles	10/ 4/2005
Reviewed By:	Fuhrer, Ed	10/ 6/2005
Approved By:	Warfel, Don	12/21/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-082

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
Fire Protection (FP)

Document References:
B.1.19

NRC Representative Villaran, Mike

AmerGen (Took Issue):

Question

LRA AMP B.1.19 Fire Protection (FP)

Note: It is preferred that requested documents be provided in both hard copy and searchable (e.g., searchable Adobe pdf, Word, or Word Perfect) electronic file formats.

1.Please provide plant-specific system training documents (e.g., system training manuals) for each system that credits the Fire Protection Aging Management Program

2.Please make available at the audit, in both hardcopy and electronic format, the document(s) that compare the ten elements in FP AMP B.1.19 to the ten elements in AMP XI.M26 of NUREG-1801.

3 Considering the relatively short time period remaining before OCGS enters the license renewal period, the staff expects that considerable progress has already been made in developing and formally documenting the implementing procedures required for new AMPs, and for significant enhancements to existing AMPs. In light of this, please address each of the following questions regarding the current status of implementing procedures for this AMP:

(a) Please provide the status of the implementing procedures for each enhancement to the existing program

(b) Please provide the schedule for initiating each of the enhancements to the existing program

(c) Please provide a sample of an implementing procedure for one enhancement to the existing program

(d) Please provide the results of any enhanced inspections that have already been completed.

4.With regard to AMP B.1.19, Fire Protection

Please describe the recurring task work order inspection process and how it is implemented at Oyster Creek.

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Please provide the technical basis for the recurring task work order inspection process.

Please provide a table/list that identifies components that are inspected under an established procedure, and components that are inspected under the "recurring task work order inspection process.

Please identify the frequency of inspection for each system / component within the scope of the Fire Protection AMP.

5.Please provide the Fire Protection Licensing Basis for Oyster Creek (License Condition, Safety Evaluation Reports, etc.), the Fire Hazards Analysis (FHA) and Appendix R /Post-fire Safe Shutdown Analysis (if not incorporated into the FHA).

6.AMP B.1.19, Fire Protection, states that appropriate mitigating actions have been taken to correct degraded fire doors. With regard to the identification and resolution of degraded fire doors, please provide plant-specific data (e.g., Condition Reports / Action Requests / Work Requests and close-out documents) that have been generated in the past five years (since 9/1/2000). In addition, please specify the inspection interval and the technical basis (engineering evaluation) developed to support the established interval.

7Silicone foam fire barrier penetration seals are used at Oyster Creek. As described in several generic communications issued by the staff (i.e., IN 88-56, IN 94-28, and IN 97-70), silicone foam fire barrier penetration seals have experienced a number of failures (splits, shrinkage, voids, lack of fill). Please provide the OC evaluation of the referenced Information Notices.

8.AMP B.1.19, Fire Protection, states that fire barrier penetration seals are visually inspected for signs of degradation, through periodic inspections that are implemented through recurring task work orders and station procedures. GALL Element 4 specifies that 10% of each type of penetration seal must be visually inspected by qualified fire protection inspectors. Identify the specific types of penetrations seals installed at OC and demonstrate that 10% of each type of seal is visually inspected by qualified individuals each refueling cycle. In addition, describe the qualifications and training requirements for personnel that perform the inspections. Please describe how this inspection method achieves consistency with NUREG-1801 (GALL) Element 3, which requires that a visual inspection of approximately 10% of each type of penetration seal be performed at least once every refueling outage.

9.As noted in the exception to AMP B.1.19, the Oyster Creek halon and carbon dioxide fire suppression systems each undergo a system operability and flow test every 18 months, which is not consistent with the GALL Element 4 criteria of every six months. The acceptability of this exception appears to be based on the following activities:

Verification of the halon system storage tank weight, level and pressure every 6 months.
The carbon dioxide system surveillance verifies the tank charge once per week, and valve alignment once per month.

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As discussed in ISG-04, activities such as these assure the operational readiness of the Halon and CO2 systems but do not support aging management. It is not clear how activities that do not support aging management can, by themselves, be used to justify the exception to the GALL AMP criteria. Please clarify and provide additional technical justification in support of this exception.

10.LRA Section 2.1.3.4 Systems and Structures Credited for Regulated Events" states that all systems, structures and components relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission's regulations for fire protection (10 CFR 50.48) were included in the scope of license renewal in accordance with 10 CFR 54.4(a)(3) requirements.

Components that are relied on to achieve and maintain cold shutdown conditions in the event of fire perform a function that demonstrates compliance with the fire protection rule (10 CFR 50.48). These components are stored on-site (typically in a warehouse).

Does the Oyster Creek Appendix R Fire Hazards Analysis / Safe Shutdown Analysis credit the installation of replacement parts to achieve and maintain cold shutdown conditions? If so, are the spare parts included in the scope of license renewal? If the spare parts are not included in the scope of license renewal, please describe how the effects of aging will be managed during the period of extended operation.

11.Please provide the Fire Protection Technical Position Paper referenced in Section 2.1.3 of the LRA.

12.The LRA states that the Oyster Creek experience with fire barrier penetration seals is consistent with the industry experience. Provide the Oyster Creek operating experience data and the results of your comparison of this data to industry operating experience.

13.Please provide the Oyster Creek evaluation of NRC Information Notice 92-28, Inadequate Fire Suppression System Testing.

Assigned To: Getz, Stu

Response:

1. Any required system training documents will be provided for each system that credits the Fire Protection Aging Management Program. The following documents were transferred to Ken Sullivan on 10/03/2005: OC Operator Training Packages for Containment Spray/ ESW, Fire Protection, RBCWW, Service Water System, Service Air and TBCCW.

2. The 10-element review of Program B.1.19, Fire Protection, will be provided in hardcopy and electronic form for the AMP audit.

3. (a) Implementing procedures for enhancements to program B.1.19 have been identified, and

several are under development and in draft form. None are complete as of this time.
(b) Enhancements to the B.1.19 program for Fire Protection are to be implemented prior to the period of extended operation.
(c) A draft sample of an implementing procedure for an enhancement to the existing Fire Protection program will be provided for the AMP audit.
(d) No enhanced inspections have been performed as of this time; consequently no inspection results are available.

4. A recurring task is a preventive maintenance task which is performed at a specified frequency. Exelon procedure MA-MA-716-009, "Preventive Maintenance (PM) Work Order Process" establishes and describes the PM work order process, and defines the responsibilities for the performance and documentation of the process. This procedure will be made available for review during the AMP audit.

Oyster Creek Site Fire Protection Program 101.2 identifies components to be inspected and the required inspection frequencies. Individual RT work orders for specific components also identify required inspection frequencies. Program 101.2 and examples of RT work orders will be made available for review during the AMP audit.

5. Oyster Creek fire protection licensing basis documents such as the Fire Hazards Analysis Report and the specification for Post-Fire Safe Shutdown Program Requirements will be made available for review during the AMP audit.

6. OC Site Fire Protection Program 101.2 specifies inspection intervals for fire doors. Oyster Creek procedure FPE-OC-000814-005, "Fire Door Evaluation", establishes acceptance criteria for steel fire doors. Copies of these documents will be available during the AMP audit.

7. IN 88-56, "Potential Problems with Silicone Foam Fire Barrier Penetration Seals", IN 94-28, "Potential Problems with Fire Barrier Penetration Seals", and IN 97-70, "Potential Problems with Fire Barrier Penetration Seals" discuss problems with silicone foam fire barrier seals such as voids, gaps, and splits which could result from factors including method of installation, technical and quality control of the material, method of final inspection, environment, etc. As discussed in NRC Inspection Report Number 50-219/93-10, Oyster Creek's installation procedure requires that damming material must be removed for inspection after the silicone foam was injected into the penetration; therefore if voids were found, correction was made during the installation process. Surveillance of these penetration seals also directs verification that the foam material is not damaged or missing from the face of the seal and has not shrunken from the penetration opening or penetrating objects creating an excessive gap. Removal of the damming material is directed if it is suspected that the silicone foam material has been disturbed. The inspection report concluded that, based on the visual inspection program during installation and the ongoing surveillance inspection of the silicone foam penetrations, the foam voiding problem described in IN 88-56 appeared not to be a problem at Oyster Creek. The continuing surveillance program directing inspection of the condition of the foam material and requiring removal of the damming material for inspection if it is suspected that the silicone foam material has been disturbed provides assurance that any voids, gaps, splits, or shrinkage as discussed in the above INs would be detected.

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8. Per Oyster Creek Procedure 645.6.017, "Fire Barrier Penetration Surveillance", types of penetration seals for which aging management is required are: grouted, RTV Foam, and concrete/metal floor plugs/metal hatch covers. Temporary penetration seals are also addressed by this procedure but are only installed to support modification/maintenance activities and are not subject to aging management. Currently, inspection of all penetration seals of each type is performed at least once per refuel cycle. This number may be reduced by future procedure changes but at no time will inspection requirements be less than the GALL requirement of 10% of each type of penetration seal, performed at least once per refuel cycle.

Oyster Creek procedures for qualification and training requirements for personnel performing inspections under the Fire Protection program will be provided during the AMP audit.

9. Verification of the halon system storage tank weight, level, and pressure every 6 months, and verification of the carbon dioxide tank charge once per week would provide indication of any system leak due to aging related degradation. The system functional tests and visual inspections are performed every 18 months, and will be enhanced specifically for inspection of the indoor piping and components for external surface corrosion degradation and mechanical damage. The frequencies of these inspections are considered sufficient to ensure system availability and operability, considering station operating experience that indicates no occurrence of aging related degradation having adversely affected either system's operation.

10. Equipment that is stored on site for installation in response to a design basis event is considered to be within the scope of license renewal. At Oyster Creek, certain Appendix R fire scenarios utilize stored equipment to facilitate repairs following the fire. The stored equipment credited for Appendix R repairs include cables and connectors, hoses, tubing, fittings, screws, nuts, washers, exhaust fans, and flexible duct. These components are confirmed available and in good operating condition by periodic surveillance inspections. Tools and supplies used to place the stored equipment in service are not in the scope of license renewal.

11. Fire Protection Technical Position Paper PP-07, "Fire Protection Systems" will be provided for the AMP audit.

12. A review of inspection report results and selected OC CAP items indicates that industry-typical aging-related issues with silicone foam seals as described in IN 88-56, "Potential Problems with Silicone Foam Fire Barrier Penetration Seals", IN 94-28, "Potential Problems with Fire Barrier Penetration Seals", and IN 97-70, "Potential Problems with Fire Barrier Penetration Seals" have also occurred at Oyster creek -- including shrinkage and pull-away of the foam material from the penetrating elements and penetration walls. These conditions when identified are dispositioned and trended in accordance with the correction action program.

13. A copy of the OC evaluation for IN 92-28 will be provided during the AMP audit. The IN describes concerns regarding inadequate initial testing of gaseous fire suppression systems and leakage paths from areas protected by these systems. The OC evaluation listed the areas of interest at the OC plant and provided results of the tests for gas concentration, with identification of one area requiring subsequent analysis and confirmatory testing.

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LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Getz, Stu	9/29/2005
Reviewed By:	Muggleston, Kevin	1/ 5/2006
Approved By:	Warfel, Don	1/ 5/2006

NRC Acceptance (Date): 1/26/2006

NRC Information Request Form

Item No
AMP-083

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
Fire Water System (FW)

Document References:
B.1.20

NRC Representative Villaran, Mike

AmerGen (Took Issue):

Question

LRA AMP B.1.20 Fire Water System (FW)

Note: It is preferred that requested documents be provided in both hard copy and searchable (e.g., searchable Adobe pdf, Word, or Word Perfect) electronic file formats.

1.Please provide plant-specific system training documents (e.g., system training manuals) for each system that credits the Fire Water Aging Management Program
2.Please make available at the audit, in both hard copy and electronic format, the document(s) that compare the ten elements in FW AMP B.1.20 to the ten elements in AMP XI.M27 of NUREG-1801.
3.Considering the relatively short time period remaining before OCGS enter the license renewal period, the staff expects that considerable progress has already been made in developing and formally documenting the implementing procedures required for new AMPs, and for significant enhancements to existing AMPs. In light of this, please address each of the following questions regarding the current status of implementing procedures for this AMP:

(a) Please provide the status of the implementing procedures for each enhancement to the existing program

(b) Please provide the schedule for initiating each of the enhancements to the existing program

(c) Please provide a sample of an implementing procedure for one enhancement to the existing program

(d) Please provide the results of any enhanced inspections that have already been completed.
4.Please identify the plant commitments pertaining to NFPA codes and standards.

5.This AMP states that the program will be enhanced to include periodic non-intrusive wall thickness measurements (volumetric inspections) of selected portions of the fire water system, to be performed at intervals not to exceed every 10 years. NUREG-1801 (Element 4) states that these inspections are to be performed before the end of the current operating term and at plant-specific intervals thereafter during the period of extended operation. Please provide the technical basis which supports: (a) the

10 year inspection interval; (b) the determination of "selected portions" of the system that are to be subjected to volumetric inspections; and (c) extrapolation of above grade piping test results to below grade piping (if applicable). In addition, it is not clear if these inspections will be performed before the end of the current operating term as required by GALL. Please clarify.

Please provide data that shows the actual dates that sprinklers included within the scope of license renewal were installed.

Assigned To: Muggleston, Kevin

Response:

1. The only system that credits the Fire Water System Aging Management Program is the Fire Protection system. The training manual for the Fire Protection system has been provided.

2. The 10-Element review document for Program B.1.20, Fire Water System program, has been provided in hardcopy and electronic form.

3(a). See database report of procedure status associated with the Fire Water program.

3(b). This issue will be discussed in AmerGen presentation.

3(c). The required enhancements are documented in an action tracking database (Passport). The enhancements will be incorporated into the PIMS work management PM process.

3(d). Enhanced inspections have not been performed.

4. The Codes and Standards used in the design and installation of the Oyster Creek fire protection systems are identified in UFSAR Section 9.5.1.2.2. A hard copy of this UFSAR Section will be provided.

5.(a) The frequency is based on good operating experience with the fire protection system piping.

A review of operating experience has identified a single case of through-wall piping failure, and this failure was associated with a 1 ½" cooling water line on one of the diesel driven fire pump diesel engines. This line is exposed to water flow conditions when the diesel driven pump is operated, and drains back to the pump bay when the diesel pump is not operating. A failure analysis was performed on a sample of the failed piping. The failure analysis determined that turbulent flow downstream of a 90° elbow tended to remove corrosion product buildup, and that constant removal of corrosion product buildup would expose fresh metal leading to accelerated attack. The preferential attack identified on the bottom of the pipe suggests the attack might have been influenced by incomplete drainage following pump operation. The resulting stagnant lay-up of fresh water provides a favorable condition for MIC attack. The condition created pin-hole leaks which have been repaired. As a result of this failure, NDE inspections were performed at piping locations subject to similar

conditions. Some additional small bore wall thinning has been identified, and is being tracked for repair and replacement.

The Fire Protection system manager has performed visual inspections of piping internal conditions when exposed during maintenance activities. The piping internals have been observed to be in very good condition with no significant internal fouling or corrosion buildup. System flow tests have not indicated increasing system pressure drop.

Initial inspections will be performed prior to the period of extended operation. As stated in NRC ISG-04, fire protection piping is typically designed for a 50-year life. Many sprinkler systems were installed in the 1979 to 1981 timeframe, and as such will not reach a 50-year life until well after the end of the current operating term and also well beyond the first 10-year inspection. The initial plant construction period was approximately 4 years, so the earliest date for sprinkler installations would be early to mid 1965. In accordance with NFPA standards, sprinkler head sampling is recommended after 50 years in service, with additional sampling at 10-year intervals thereafter.

Based on these system design and inspection standards, and the good operating experience with respect to fire protection system piping internal conditions, initial NDE inspections prior to the period of extended operation, with additional periodic inspections at 10-year intervals thereafter, will assure detection of aging effects prior to loss of system intended functions.

If the NDE inspections detect significant wall thinning or fouling due to internal corrosion, the inspection results will be evaluated by engineering for acceptability. Engineering will determine the rate at which the corrosion is progressing. Unacceptable results will be documented in the corrective action program. An extent of condition review, which is an integral part of the corrective action program, addresses the need to expand the inspection sample population or adjust the inspection frequency if appropriate.

(b) The inspection locations have not been selected. The selected portions will be from stagnant no-flow portions of the sprinkler systems that contain water. To assure the locations are varied and provide a good representation of system internal conditions, locations will be selected as follows:

- A minimum of 10 locations will be selected
- A minimum of 4 locations will be selected from fire water system piping in the reactor building
- A minimum of 4 locations will be selected from fire water system piping in the turbine building
- Selected locations will include a minimum of 2 sprinkler systems in the reactor building and 2 sprinkler systems in the turbine building, in the small bore piping downstream of the sprinkler isolation valve and flow alarm valve.
- Selected locations will include a minimum of 2 locations in the large bore (>4") branch piping that supplies the various sprinkler systems and hose stations.
- A minimum of one location on a large bore fire pump discharge line at the fire pumphouse will be included.

(c) Above grade piping is representative of below grade piping for purposes of internal inspections, as the materials and internal environments are similar. The piping material is the same. The buried

piping is a heavier wall pipe. The internal fluid is the same.

Initial inspections will be performed prior to the period of extended operation.

In addition to the sprinkler systems installed during initial construction as discussed above, a number of additional sprinkler systems were installed after Oyster Creek construction, in the 1979 to 1980 time frame.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Muggleston, Kevin	10/ 3/2005
Reviewed By:	Getz, Stu	10/ 3/2005
Approved By:	Warfel, Don	1/ 3/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-084

Date Received: 9/23/2005
Source AMP Audit
Status: Closed

Topic:
ASME Section XI, Subsection IWF

Document References:
B.1.28

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.28-1:

The applicant is requested to identify the document(s) that includes the evaluation of OCGS AMP B.1.28 against the program elements of GALL XI.S3, and to make it available in both electronic and hard-copy formats for the on-site AMP audit.

Assigned To: Corsi, Lou

Response:

The 10-Element review for AMP B.1.28 , ASME Section XI, Subsection IWF, is provided for review in hardcopy and electronic copy format.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Corsi, Lou 9/27/2005

Reviewed By: N/A

Approved By: Warfel, Don 10/ 5/2005

NRC Acceptance (Date): 10/ 5/2005

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-085		9/23/2005	AMP Audit
Topic:		***Status:***	Closed

ASME Section XI, Subsection IWF

Document References:
B.1.28

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.28-2:

Considering the relatively short time period remaining before OCGS enters the license renewal period, the staff expects that considerable progress has already been made in developing and formally documenting the implementing procedures required for new AMPs, and for significant enhancements to existing AMPs. In light of this, please address each of the following questions regarding the current status of implementing procedures for this AMP:

(a) Please provide the status of the implementing procedures for each enhancement to the existing ASME Section XI ISI, Subsection IWF program.

(b) Please provide the schedule for initiating each of the enhancements to the existing ASME Section XI ISI, Subsection IWF program.

(c) Please provide a sample of an implementing procedure for one enhancement to the existing ASME Section XI ISI, Subsection IWF program.

(d) Please provide the results of any enhanced inspections that have already been completed.

Assigned To: Corsi, Lou

Response:

(a) Please provide the status of the implementing procedures for each enhancement to the existing ASME Section XI ISI, Subsection IWF program.

Procedures (copies provided) have been drafted (markups) to implement enhancements to the existing ASME Section XI ISI, Subsection IWF program.
OC-1 ISI Program Plan is still being reviewed for changes and planned to be updated prior to 12/31/06.

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(b) Please provide the schedule for initiating each of the enhancements to the existing ASME Section XI ISI, Subsection IWF program.

Enhancement inspections are anticipated to be complete by 12/08.

(c) Please provide a sample of an implementing procedure for one enhancement to the existing ASME Section XI ISI, Subsection IWF program.

Copies of Marked up drafts were provided:
2400 GMM-3900.52 Inspection and Torquing of Bolted Connections,
ER-AA-330 Conduct of Inservice Inspection Activities,
ER-AA-330-003 Inservice Inspection of Section XI Component Supports and
ER-AA-335-016 VT-3 Visual Examination of Component Supports and Attachments are available for review.

OC-1 (359 pages) ISI Program Plan Fourth Ten-Year Inspection Interval will be available for review but is still being revised. We plan to revise and issue by 12/31/06.

(d) Please provide the results of any enhanced inspections that have already been completed.

Enhanced inspections have not been performed at this time.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 9/26/2005

Reviewed By: Miller, Mark 10/10/2005

Approved By: Warfel, Don 10/ 5/2005

NRC Acceptance (Date): 10/ 5/2005

NRC Information Request Form

Item No
AMP-086

Date Received: 9/23/2005

Source AMP Audit

Topic:
ASME Section XI, Subsection IWF

Status: Closed

Document References:
B.1.28

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.28-3:

OCGS AMP B.1.28 identifies an enhancement to include additional MC supports. Please provide the following information related to this enhancement:

(a) Identify the MC supports that are currently included in the existing IWF inspection program.

(b) Identify the MC supports that will be added to the scope of the IWF inspection program for the license renewal period.

(c) Specify the current inspection program and describe the current inspection details for the MC supports that are identified in (b) above.

(d) Confirm that, after enhancement, all MC supports will be included in the scope of the IWF inspection program for the license renewal period.

Assigned To: Corsi, Lou

Response:

a) The MC supports that are currently included in the existing IWF inspection program are:

Existing Containment Program - IWE (above water line - internal)
E1.20 Downcomers
E1.20 Ring Header within Torus
E1.20 Vent Lines - DW to Torus Vent Lines

Existing Torus Exterior - IWF MC Supports
F1.40 Torus Support - Sway Braces

(b) The MC supports that will be added to the scope of the IWF inspection program for the license

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renewal period are:

Torus (Internal) - IWF MC Supports To Be Added

Torus Support - Base Plate and Saddle
Torus Support - Inner Support Column
Torus Support - Outer Support Column

Torus Internal - Downcomer Brace Support (underwater)
Vent Header Ring Header Support (Above water)
Vent System Inner Support Column (above and below water)
Vent System Outer Support Column (above and below water)

(c) Specify the current inspection program and describe the current inspection details for the MC supports that are identified in (b) above.

OC-1 ISI Program Plan Section 4.0 Component Support ISI Plan contains the current inspection details for MC supports. Additional work will be done with the components identified in (b) above to confirm the current inspection practice.

(d) Confirm that, after enhancement, all MC supports will be included in the scope of the IWF inspection program for the license renewal period.

All MC support will be included.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 9/23/2005

Reviewed By: Miller, Mark 10/10/2005

Approved By: Warfel, Don 10/ 5/2005

NRC Acceptance (Date): 10/ 5/2005

NRC Information Request Form

Item No
AMP-087

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
ASME Section XI, Subsection IWF

Document References:
B.1.28

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.28-4:

OCGS AMP B.1.28 identifies an enhancement to inspect underwater supports for loss of material due to corrosion and loss of mechanical function. Please provide the following information related to this enhancement:

(a) Identify the specific underwater supports that will be added to the scope of the IWF inspection program for the license renewal period, including the system name and ASME Code Class.

(b) Specify the current inspection program and describe the current inspection details for the underwater supports that are identified in (a) above.

(c) Confirm that, after enhancement, all ASME Code Class underwater supports will be included in the scope of the IWF inspection program for the license renewal period.

Assigned To: Corsi, Lou

Response:

(a) Identify the specific underwater supports that will be added to the scope of the IWF inspection program for the license renewal period, including the system name and ASME Code Class.

Torus Internal
Downcomer Brace Supports (underwater)
Vent System Inner Support Column (above and below water)
Vent System Outer Support Column (above and below water)

(b) Specify the current inspection program and describe the current inspection details for the underwater supports that are identified in (a) above.

OC does perform underwater inspections of the torus for removal of sludge or debris (FME), inspect

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suction strainers for damage or obstruction, improve water clarity, assess coating and reestablish the coating barrier in deficient area. It may identify loose or damaged supports; however, it does not specifically look at IWF supports underwater.
{We are reviewing changes to OC-1 which will include 10% inspection of underwater supports.} The 10% inspection was deleted to include 100% in PBD-B-1.28 R/0 - LJC 12/6/2005

(c) Confirm that, after enhancement, all ASME Code Class underwater supports will be included in the scope of the IWF inspection program for the license renewal period.

All underwater MC support will be included.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Corsi, Lou 1/ 6/2006

Reviewed By: Miller, Mark 1/ 6/2006

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date): 10/ 5/2005

NRC Information Request Form

Item No
AMP-088

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
ASME Section XI, Subsection IWF

Document References:
B.1.28

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

B.1.28-5:

In the OCGS AMP B.1.28 discussion of operating experience, the applicant refers to the results of the most recent IWF inspections (1st inspection period of the 4th inspection interval), and states "There were challenges identified during this inspection. Scope expansion was required due to unacceptable as-found conditions on rod hangers. The identified conditions were evaluated or repaired, as required, and determined acceptable for return to service".

Please provide the following information related to this recent operating experience:

(a) Identify the system(s), ASME Code Class, the initial sample size, and the percentage found to be unacceptable.

(b) Identify whether loss of material due to corrosion, loss of mechanical function, or both aging effects were observed. Did the as-found unacceptable conditions compromise any intended functions?

(c) Identify the final sample size, after scope expansion, and the percentage found to be unacceptable.

(d) Identify the number of supports returned to service based solely on evaluation and the number of supports returned to service after repair.

(e) Describe the root cause evaluation and the corrective actions taken to prevent recurrence.

(f) Identify any additional inspections scheduled for the next inspection period.

Assigned To: Corsi, Lou

Response:

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Please provide the following information related to this recent operating experience:

(a) Identify the system(s), ASME Code Class, the initial sample size, and the percentage found to be unacceptable.

The systems were: Isolation Condenser, Core Spray System, Standby Liquid Control Shutdown Cooling, Reactor Water Clean Up, Reactor Recirc, Control Rod Drive, Containment Spry, Feedwater and Reactor Building Closed Cooling Water System piping supports, ASME Code Class 1 & 2. Initial sample size (40) and percentage found to be unacceptable 2.5%.

(b) Identify whether loss of material due to corrosion, loss of mechanical function, or both aging effects were observed. Did the as-found unacceptable conditions compromise any intended functions?

Loss of material due to corrosion was not identified. One case was a loss of preload which was corrected and the 3 spring cans were not loss of mechanical function however, the load settings were outside the tolerance. However, there was not a compromise of intended function. Reference CAP's 02004-331 and -3341 along with A2078197.

(c) Identify the final sample size, after scope expansion, and the percentage found to be unacceptable.

Sample size was 51 after scope expansion and the number was a total of 4%.

(d) Identify the number of supports returned to service based solely on evaluation and the number of supports returned to service after repair.

None were returned to service based on evaluation. All were restored/reworked to its intended design configuration

(e) Describe the root cause evaluation and the corrective actions taken to prevent recurrence.

See AR-Eval A2078197 E23 (provided) for the "root cause" failure evaluation.

(f) Identify any additional inspections scheduled for the next inspection period.

Reinspections have been scheduled as part of ISI program at the next outage.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 9/27/2005

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Reviewed By: Miller, Mark		10/10/2005
Approved By: Polaski, Fred		12/15/2005
NRC Acceptance (Date):	10/ 5/2005	

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Item No
AMP-089

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
Structures Monitoring Program

Document References:
B.1.31-1

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(B.1.31-1): The applicant is requested to identify the document(s) that includes the evaluation of the OC program against the program elements of GALL XI.S6, and to make it available in both electronic and hard-copy formats for the on-site AMP audit.

Assigned To: Ouaou, Ahmed

Response:

The 10-Element review for AMP B.1.31, Structures Monitoring Program, is provided to the reviewer in hardcopy and electronic copy format. The implementing draft procedure, 125.6, is available in hardycopy for review.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 9/28/2005

Reviewed By: N/A

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-090

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
Structures Monitoring Program

Document References:
B.1.31-2

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(B.1.31-2):

Considering the relatively short time period remaining before OCGS enters the license renewal period, the staff expects that considerable progress has already been made in developing and formally documenting the implementing procedures required for new AMPs, and for significant enhancements to existing AMPs. In light of this, please address each of the following questions regarding the current status of implementing procedures for this AMP:

(a) Please provide the status of the implementing procedures for each enhancement to the existing Structures Monitoring Program.

(b) Please provide the schedule for initiating each of the enhancements to the existing Structures Monitoring Program.

(c) Please provide a sample of an implementing procedure for one enhancement to the existing Structures Monitoring Program.

(d) Please provide the results of any enhanced inspections that have already been completed.

Assigned To: Ouaou, Ahmed

Response:

a) The implementing procedure, 125.6 is in draft form and scheduled to be completed and issured by 12/31/06.
B) We plan to begin the Structures Moinitoring Program (SMP) inspections using enhanced criteria in Ooctor 2005. We anticipate to complete all inspections and any followup actions by 12/08
c) Draft procedure 125.6, is in the revision process for enhancements. Rough draft is available for review
d) Enhanced inspections have not been performed

LRCR #: ***LRA A.5 Commitment #:***

NRC Information Request Form

IR#:

Approvals:

Prepared By:	Ouaou, Ahmed	9/29/2005
Reviewed By:	Getz, Stu	10/ 6/2005
Approved By:	Warfel, Don	10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-091

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
Structures Monitoring Program

Document References:
B.1.31-3

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(B.1.31-3):

The scope of the enhancements listed for AMP B.1.31 are quite significant, and encompass several elements that would be expected to be part of an existing Structures Monitoring Program. Notable examples are the inclusion of anchors and embedments, and component supports outside the scope of IWF, and the addition of loss of material due to corrosion of steel components to the current inspection criteria. Consequently, the applicant is requested to

(a) specifically describe the scope of the currently existing program, including the structures and components in the scope of the existing program; the aging effects that are monitored; the inspection methods employed; and the inspection frequency;

(b) specifically describe the scope of AMP B.1.31, including the structures and components in the scope of AMP B.1.31; the aging effects that are monitored; the inspection methods employed; and the inspection frequency; and

(c) for the structures and components that will be added to the Structures Monitoring Program scope for license renewal, describe the aging management activities that are currently being implemented.

Assigned To: Ouaou, Ahmed

Response:

a) The scope of the existing program is designed to meet the NRC's Maintenance Rule, 10 CFR 50.65. It is based on NEI 96-03, "Guidelines for Monitoring the Condition of Structures at Nuclear Power Plants", NUREG-1522, "Assessment of Inservice Conditions of Safety-Related Nuclear Plant Structures", NUREG-1526, "Lessons Learned from Early Implementation of the Maintenance Rule at Nine Nuclear Power Plants", and ACI 349.3R-96, "Evaluation of Existing Nuclear Safety-Related Concrete Structures". The program is implemented through station procedure 125.6. The scope of program, inspection methods, inspection and acceptable criteria, and frequency are detailed in procedure 125.6 and summarized in Appendix B.1.31, the 10-elements review of the program.

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b) See above
c) The additions or enhancements to the Structures Monitoring Program are subdivided into one of following
1. There are no requirements for monitoring the structure or component under the current term. For example Oyster Creek Substation, Chlorination Facility, and SBO structures. The structures are not classified safety related and do not satisfy scoping basis criteria for structures in the scope of the Maintenance Rule, 10 CFR 50.65. They have been added to scope of the program for license renewal pursuant to 10 CFR 54.4 (a)(3).
2. The structure or component is monitored under the current program; however the structure, component, or the inspection and acceptance criteria is not explicitly listed in the implementing procedure. For example, procedure 125.6 does not specifically require inspection of structural members for loss of material due to corrosion. However the experienced engineer performing the inspection inspects structural steel members for corrosion and rust and when significant it is noted on the inspection report. For license renewal we enhanced the procedure to spell out the criteria.
3. The structure or component is not included in the scope of the Structures Monitoring Program; instead it is included in other programs or activities. For example the Fire Pond Dam is not covered by the Structures Monitoring Program, RG. 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants, or the FERC Program. However the small Class III dam is inspected periodically in accordance with New Jersey Dam Safety Standards, N.J.A.C 7:20. For license renewal, we added the dam to the scope of 125.6 to ensure that it is inspected in accordance with RG 1.127 requirements. Similarly, component supports outside the scope of IWF are covered by system engineer walkdowns and not in the scope of the Structures Monitoring Program. We elected to include them in the scope of the Structures Monitoring Program to ensure that qualified structural engineers inspect the supports and that the inspection methods, inspection and acceptance criteria, and documentation are the same as those required for major structures.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 9/29/2005

Reviewed By: Getz, Stu 10/ 6/2005

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

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Item No
AMP-092

Date Received: 9/23/2005
Source AMP Audit
Status: Closed

Topic:
Structures Monitoring Program

Document References:
B.1.31-4

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(B.1.31-4):

The AMR tables in LRA Section 3.5 credit the Structures Monitoring Program for aging management of conduits. Please confirm that conduits are included in the scope of this AMP.

Assigned To: Ouaou, Ahmed

Response:

Conduits are included in the scope of this AMP.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 10/ 6/2005

Reviewed By: Spamer, Deb 10/ 6/2005

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-093

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
Structures Monitoring Program

Document References:
B.1.31-5

NRC Representative Hoang, Dan

AmerGen (Took Issue):

Question

(B.1.31-5):

One enhancement to AMP B.1.31 is to conduct periodic sampling and testing of groundwater to confirm that the environment remains non-aggressive for buried reinforced concrete. Please provide the following information related to this enhancement:

(a) the dates and quantitative results of previous groundwater monitoring, upon which the conclusion of non-aggressiveness is based;

(b) the scheduled frequency of groundwater monitoring under AMP B.1.31.

Assigned To: Ouaou, Ahmed

Response:

a) Groundwater chemistry results are provided in LRA, Table 3.0-2, page 3.0-13. They were based on water samples taken on 10/29/04.
B) The scheduled frequency of groundwater monitoring is every 4 years.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 9/26/2005

Reviewed By: Muggleston, Kevin 1/ 6/2006

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-094

Date Received: 9/23/2005
Source AMP Audit
Status: Closed

Topic:
Structures Monitoring Program

Document References:
B.1.31-6

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(B.1.31-6):

For reference purposes, please have copies of NUMARC 93-01Rev.2, ACI 349.3R-96, and ANSI/ASCE 11-90 available during the on-site audit.

Assigned To: Ouaou, Ahmed

Response:

NUMARC 93-01 Rev. 2, ACI 349.3R-96 are available for the reviewer.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 9/29/2005

Reviewed By: Muggleston, Kevin 1/ 6/2006

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-095

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
Structures Monitoring Program

Document References:
B.1.31-7

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(B.1.31-7):

The enhancement to inspect the external surfaces of mechanical components for loss of material due to corrosion represents a very significant scope increase. The AMR tables in LRA Sections 3.1, 3.2, 3.3, and 3.4 credit this enhancement over 400 times.

Please describe the details of the implementation of this enhancement, and please provide copies of any procedures that are already developed for this enhancement.

Assigned To: Ouaou, Ahmed

Response:

Amergen recognizes this is a significant scope increase to the Structures Monitoring Program that requires planning and potentially additional resources. We plan to integrate this activity with inspections performed to satisfy 10 CFR 50.65 for structures (i.e structure monitoring). The implementing procedure, 125.6 Rev. 4, is under revision and will be issued by 12/31/06. Inspections and any followup actions will be completed by 12/31/08. Draft procedure 125.6 is available for review.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 9/28/2005

Reviewed By: Getz, Stu 10/ 6/2005

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

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Item No
AMP-096

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
Structures Monitoring Program

Document References:
B.1.31-8:

NRC Representative Hoang, Dan

AmerGen (Took Issue):

Question

(B.1.31-8):

In the discussion of operating experience, four noteworthy incidences of degradation are noted: cracking of the RB exterior walls; cracking of the drywell shield wall due to high temperature; cracking of the spent fuel storage pool concrete support beams; and degradation of the intake canal. Degradation of the intake canal is also addressed in LRA Section B.1.32, in the operating experience discussion for water-control structures.

For each of the first three incidences of degradation, please provide the plant documentation that describes the degradation, the assessment performed, the acceptance criteria applied, future monitoring recommendations, and any corrective action taken. Also describe the monitoring activities that are or will be conducted under the Structures Monitoring Program for each of the three regions.

Assigned To: Ouaou, Ahmed

Response:

The requested documentation is included in the Structures Monitoring Progam Basis Document (PBD-AMP-B.1.31) Notebook and will be available for Staff's review during the AMP audit week.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 12/16/2006

Reviewed By: N/A

Approved By: Warfel, Don 1/ 4/2006

NRC Acceptance (Date):

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Item No
AMP-097

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
Drywell Containment

Document References:

NRC Representative Morante, Rich

AmerGen (Took Issue):

<u>Question</u>

The drywell containment has experienced pre-mature corrosion. AmerGen submitted a white paper on the issue to the BNE. Please provide a copy of this White Paper.

Assigned To: Ouaou, Ahmed

<u>Response:</u>

The white paper is provided in a hardcopy format to the reviewer.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By:	Ouaou, Ahmed	10/ 1/2005
Reviewed By:	Getz, Stu	10/ 6/2005
Approved By:	Warfel, Don	10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-098

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
Underground Piping

Document References:

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

Underground piping has history of leaks. Underground piping is also difficult to inspect. Minimizing underground leaks not only protects the environment but limits the cleanup effort required during decommissioning. AmerGen submitted a white paper to the BNE on this issue. Please provide a copy of this White Paper.

Assigned To: Rafferty-Czincila, Shannon

Response:

A copy will be provided during the audit.
- Copies provided on 10/3/05.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 9/29/2005

Reviewed By: Hufnagel, John 9/29/2005

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 5/2005

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Item No
AMP-099

Date Received: 9/23/2005

Source AMP Audit

Status: Closed

Topic:
Underground Cables

Document References:

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

Underground cables have a history of failures. AmerGen submitted a white paper to the BNE on this issue. This issue is currently under review by the BNE. Please provide a copy of this White Paper.

Assigned To: Spamer, Deb

Response:

White paper for underground provided.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Spamer, Deb 9/30/2005

Reviewed By: N/A

Approved By: Warfel, Don 12/20/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-101

Date Received: 10/ 4/2005

Source AMP Audit

Status: Closed

Topic:
B.1.34 - 10 Element Review - Element 3 and Element 6

Document References:
B.1.34

NRC Representative Mathew, Roy

AmerGen (Took Issue): Spamer, Deb

Question

Provide clarification of how the Oyster Creek B.1.34 program implements "Parameters Monitored/Inspected" element with respect to the following:
- How does the Oyster Creek program identify localized environments per procedure MA-AA-723-500?
- How is a representative sample selected for inspection?
- What is the technical basis for selection of areas to be inspected?

.
Provide clarification of the Oyster Creek specific acceptance criteria for B.1.34.

Assigned To: Spamer, Deb

Response:

Element 3

The Oyster Creek bases for element 3, parameters monitored/inspected, incorporate Oyster Creek cable insulation 60 year design limits for temperature and radiation, general area ambient conditions, and a process for the identification of adverse environments.

In general, the Oyster Creek B.1.34 program will inspect accessible cables and connections in areas with ambient conditions in excess of insulation 60 year design limits as well as accessible cables and connections in identified adverse localized environments. The only exceptions would be per engineering evaluation.

The following paragraphs provide specifics with respect to questions asked.

Part 1
Localized adverse environments are identified considering Oyster Creek specific environmental considerations.

Design engineering lists known adverse localized temperature and radiation environments. Sources

for this list include plant operating history, corrective action work requests, previous walkdown data and radiation protection surveys. Engineering documents what areas are to be walked down by maintenance for identification of localized adverse environments. Electrical maintenance then performs walkdowns for areas selected by engineering. The walkdowns include consideration for areas containing cables and connections in close proximity to hot process pipe and equipment. Typical areas for adverse environmental conditions include areas with high temperature process fluid piping and vessels, and areas with equipment that operate at high temperature, which will include areas near main steam isolation valves, main steam pipe tunnels, and areas adjacent to uninsulated process piping.

It is important to note that general area inspections will be performed in addition to inspections in adverse localized environments, since Oyster Creek ambient conditions are in excess of insulation 60 year design limits.

Part 2
This program is for a representative sample of accessible cables and connections where the sample is not based on a sampling specification or percentage but rather on a focus to include the key areas of concern. Key areas of concern include general areas where ambient conditions are in excess of 112 degrees F and a cumulative 60 year radiation dose of 30E06 rads as well as adverse localized environments. Inspections are to be performed on accessible cables and connections in the identified general areas and adverse localized environments, where accessible is defined at cables and connections that can be reviewed and approached easily. Inspections may be evaluated by engineering for possible elimination in locations where general and localized environmental conditions do not exceed cable and connections design limits.

Part 3
Oyster Creek specific environmental criteria identifies general areas for walkdown and inspection. These general areas for walkdown are taken from the Oyster Creek Engineering Standard ES-027 for Environmental Parameters. Oyster Creek 60 year maximum temperature is 256 degrees F. Oyster Creek's 60 year maximum radiation dose is 30E06 rads. For Oyster Creek cables, the 60 year limiting temperature is 112 degrees F for PVC insulation. For Oyster Creek cables, the 60 year service limiting radiation dose is below the 30E06 rads for insulations made of fluorinated ethylene propylene, silicon, and neoprene.

Because the Oyster Creek environmental parameters exceed the design limits of the cable insulations, conservatively, accessible cables and connections in rooms and plant areas exceeding 112 degrees F and a 60 year dose of 30E06 rads will be inspected. These areas include: Drywell Zones I, II, III, IV, V, VI, VII; Reactor Building Zone 35 – the steam tunnel; and Turbine Building Zones D and L. In addition to these general area inspections, inspections will be done for accessible cables and connections in adverse localized environments where the threshold for adverse is defined as in excess of 112 degrees F or with a 60 year dose of 30E06 rad or greater.

Therefore, general area inspections are included in this program along with adverse localized environment inspections for accessible cables and connections.

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Element 6

The acceptance criteria for this program is that the inspected cables and connections are to be free from visual indications of surface anomalies, such as discoloration, embrittlement, cracking, softening, deformation, swelling or surface contamination such as moisture, chemicals or oil. Inspections will also look for evidence of moisture accumulation or water damage on cable raceways. Anomalies will be documented and provided to design engineering for further evaluation and subsequent corrective actions.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 10/ 5/2005

Reviewed By: Honan, Dave 10/17/2005

Approved By: Warfel, Don 10/18/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-102

Date Received: 10/ 4/2005

Source AMP Audit

Status: Closed

Topic:
B.1.34 - 10 Element Review - Element 7

Document References:
B.1.34

NRC Representative Mathew, Roy

AmerGen (Took Issue): Spamer, Deb

Question

Provide clarification: Does the Oyster Creek B.1.34 program implement corrective actions in accordance with 10CFR50, Appendix B?

Assigned To: Spamer, Deb

Response:

This same position is already stated in the LRA, section B.0.3.

As stated in the 10 element review, unacceptable visual indications of connection and cable jacket surface anomalies will be subject to an engineering evaluation under the corrective action process. Oyster Creek's corrective action process is governed by 10CFR50, Appendix B which is implemented by the corporate adminstrative procedures. The corrective action process generically applies to Oyster Creek activities, even when not specifically invoked by a procedure line item.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 10/ 5/2005

Reviewed By: Cockroft, John 10/ 5/2005

Approved By: Warfel, Don 10/18/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-103		10/ 4/2005	AMP Audit
Topic:		***Status:***	Closed

ASME Section XI ISI IWB, IWC, IWD (October 3, 2005)

Document References:

B.1.1

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Getz, Stu

Question

B.1.1-9 Please confirm the components within the scope of this program are as specified in ASME Subsections IWB-1100, IWC-1100, and IWD-1100 for Class 1, 2, and 3 components, respectively, and include all pressure-retaining components and their integral attachments.

Assigned To: Getz, Stu

Response:

The OC ISI program details the requirements for examination, testing, repair, and replacement of components specified in ASME Section XI Subsections IWB-1100, IWC-1100, and IWD-1100 for Class 1, 2, and 3, respectively, including all pressure-retaining components and their integral attachments.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Getz, Stu	10/ 4/2005
Reviewed By:	Miller, Mark	10/11/2005
Approved By:	Warfel, Don	10/12/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-104

Date Received: 10/ 4/2005

Source AMP Audit

Status: Closed

Topic:
GALL AMP: XI.M26 Fire Protection LRA AMP: B.1.19

Document References:
B.1.19

NRC Representative Villaran, Mike

AmerGen (Took Issue): Getz, Stu

Question

Adequacy / Scope of Implementing Procedures.

GALL AMP: XI.M26 Fire Protection, Program Element 3, Parameters Monitored/Inspected, requires that Hollow metal fire doors be visually inspected to verify the integrity of door surfaces and for clearances.

The OC Basis for consistency with this AMP Element states:

Selected hollow metal fire doors are visually observed weekly by corporate procedure OP-AA-201-001, Fire Marshal Tours. Oyster Creek plant specific program 101.2, Oyster Creek Site Fire Protection Program, describes fire door functionality in order to verify the operability of automatic hold-open, release, closing mechanisms, and latches.

Inspections conducted under Fire Marshall Tours are limited to limited to random inspections of Safety Related and High Risk Areas (Step 4.1.2)

Functional Inspections (Hold-open, Release and Closing Mechanisms) performed under Procedure 101.2 are limited to Category 1 Fire Barrier Doors (i.e. those necessary for preservation of SSD capability only).

Based on the above, it appears that a number of plant fire doors (e.g., doors which are not located in a Safety Related and High Risk Area or specifically required for preservation of safe shutdown capability) are not included in the scope of the procedures credited for achieving consistency with GALL Element 3, for AMP XI.M26, Fire Protection. Please clarify.

Assigned To: Muggleston, Kevin

Response:

Fire doors in the scope of license renewal are those fire doors credited to demonstrate compliance

with 10 CFR 50.48, in accordance with 10 CFR 54.4(a)(3) criteria for license renewal scoping associated with regulated events. Fire doors credited to demonstrate compliance with 10 CFR 50.48 include fire doors required to maintain a credited Fire Area barrier for 10 CFR 50 Appendix R, as defined in the Oyster Creek Fire Hazards Analysis Report (FHAR). Also included are selected fire doors required to maintain Fire Zone boundaries, and secondary containment doors that coincide with a credited Fire Area boundary. Oyster Creek commitments made to Appendix A of Branch Technical Position Auxiliary Power Conversion System Branch BTP APCSB 9.5-1 are documented in the Oyster Creek Fire Hazards Analysis Report. Appendix A commitments do not require additional fire doors to demonstrate compliance with 10 CFR 50.48, beyond those described above associated with Fire Area and Fire Zone boundaries.

Existing Oyster Creek procedures 101.2 (Table 6), R0802129, R0802166 and R0802114 identify all fire doors in the scope of license renewal. These procedures include inspection activities for all in-scope doors, and are not limited to safety related or high risk areas. The Fire Marshal Tour activities and operator tours provide an additional level of assurance beyond the GALL recommendations, and are not necessary to demonstrate adequate aging management for the in-scope fire doors.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Muggleston, Kevin 12/21/2005

Reviewed By: Getz, Stu 12/21/2005

Approved By: Warfel, Don 1/ 3/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-105

Date Received: 10/ 4/2005
Source AMP Audit
Status: Closed

Topic:
GALL AMP: XI.M26 Fire Protection LRA AMP: B.1.19

Document References:
B.1.19

NRC Representative Villaran, Mike

AmerGen (Took Issue): Getz, Stu

Question

Adequacy of Implementing Procedures.

GALL AMP: XI.M26 Fire Protection, Program Element 3, Parameters Monitored/Inspected, requires that Hollow metal fire doors be visually inspected to verify the integrity of door surfaces and for clearances.

The OC Basis for consistency with this AMP Element states:

Fire doors will be visually inspected by designated qualified personnel for signs of degradation such as wear, missing parts, holes in the skin, clearances, and other degradation per Oyster Creek plant specific program 101.2, Oyster Creek Site Fire Protection Program. .Procedures direct visual inspection of the fire door clearances

Inspections performed under the referenced procedures (Procedure 101.2 or Fire Marshal Tours) do not appear to include a verification of door clearances. Please provide implementing procedure which assures consistency with the GALL criterion for verifying clearances.

Assigned To: Getz, Stu

Response:

The Oyster Creek Fire Protection Program will be enhanced to require that clearances of fire doors in the scope of license renewal be routinely inspected every two years. Procedure 101.2 Attachment 101.2-3 Section 5.A.1 requires that these fire doors be intact, and Section 5.B.2 requires these doors be verified functional. The routine clearance inspection requirement will be added to this procedure. Currently, fire doors identified as secondary containment receive routine clearance checks, and other fire doors in the scope of license renewal receive clearance checks if they have been damaged or undergone maintenance such that the clearances may have been physically altered. The enhancement of requiring routine clearance checks for all fire doors in the scope of license renewal will provide assurance that door clearances will be satisfactory.

LRCR #: 219 *LRA A.5 Commitment #:*

NRC Information Request Form

IR#:

<u>Approvals:</u>

Prepared By:	Getz, Stu	10/ 7/2005
Reviewed By:	Muggleston, Kevin	1/ 5/2006
Approved By:	Warfel, Don	1/ 5/2006

NRC Acceptance (Date): 1/26/2006

NRC Information Request Form

Item No		*Date Received:*	*Source*
AMP-106		10/ 4/2005	AMP Audit
Topic:		*Status:*	Closed

Metal Fatigue

Document References:

B.3.1

NRC Representative Hsu, Robert

AmerGen (Took Issue): May, Mike

Question

AMP B.3.1 Metal Fatigue

a. On page 4-31, the applicant states that the isolation condenser piping outside of the containment was evaluated for a fatigue evaluations as part of a leak-before-break (LBB) analysis completed in 1991. Please provide supporting document for this statement. Please clarify that LBB analysis is valid for BWR.

b. On page 4-31, the applicant indicates that the design life of the tube bundles is 1500 cycles. Please provide documentation for 1500 cycles design life.

c. One page 4-31, please provide detail justification to support that NMP1 isolation condenser fatigue result is valid for isolation condenser of Oyster Creek.

Assigned To: May, Mike

Response:

a. The basis for concluding the Isolation Condenser piping fatigue usage is within acceptance limits for Oyster Creek license renewal is provided in report MPR-1226, titled " Leak before Break Evaluation of Isolation Condenser System Piping Outside Containment", dated April 1991. A copy of this report is enclosed in this response. Section 2.1 of the calculations discusses fatigue usage and concludes that the worst cumulative fatigue usage is less than 0.2 for 40 years of operation. The Oyster Creek License Renewal project concluded from this result that the projected fatigue usage for 60 years is also less than the acceptance limit of 1.0 (i.e. CUF60 = 0.2 X 60/40 = 0.3). This fatigue analysis is a stand-alone analysis that is valid for Oyster Creek license renewal, and does not rely on the LBB portion of this report for evaluating Isolation Condenser piping.

b. The fatigue life of the Isolation Condenser, including tube sheet, tubes, and integral outlet nozzle was re-evaluated in an analysis performed by Holtec (References 1 and 2) as part of the Isolation Condenser tubesheet and tube bundle head replacement performed in 1998 and 2000. In paragraph

9.5.1 of Reference 1 (HI-982027) it is concluded that the highest calculated stress intensity is bounded by the 1500 allowable cycles in the ASME Section III fatigue curve. Copies of these reports are enclosed.

c. The Oyster Creek isolation condenser fatigue design life is 1,500 cycles, as stated in the Oyster Creek UFSAR (Table 6.3-1) and in Section 4.3.3.2 of the Oyster Creek License Renewal Application (LRA). The source of this information is contained in two analyses (References 1 and 2). The 1,500-cycle limit applies to the tubes, tube sheet, and the integral nozzle. The Isolation Condenser cyclic limit is an Oyster Creek TLAA and is dispositioned in Section 4.3.3.2 of the LRA. As stated in the LRA, the basis for disposition is that the projected number of isolation condenser cycles will not exceed 1500-cycle limit during the period of extended operation.

The Oyster Creek Metal Fatigue of Reactor Coolant Pressure Boundary (MFRCPB) aging management program will monitor fatigue usage for the limiting Isolation Condenser locations based on a design limit of 1,500 cycles. However, the limiting Oyster Creek Isolation Condenser location fatigue usage factor, when projected to the end of the period of extended operation, is less than the fatigue usage screening criterion of 0.4 originally used to select locations for implementation into the MFRCPB program. Since the fatigue usage for the limiting isolation condenser locations is projected to be less than the 0.4 screening criterion, the isolation condenser would normally not have been included in the Oyster Creek MFRCPB program.

Because of the similarity in designs between OC and Nine Point Unit 1 plant (NMP-1), the NMP-1 fatigue analysis was also reviewed and used as a benchmark for Oyster Creek. The review of the NMP-1 analysis indicated the fatigue usage at the end of life could potentially be greater than 0.4. This assessment is discussed in the Section 4.3.3.2 of the Oyster Creek LRA. The calculated NMP-1 fatigue usage and the field history of tube failures in both the NMP-1 and Oyster Creek isolation condensers led to the decision to include the isolation condenser in the Oyster Creek MFRCPB program.

References:

1. Holtec Report, HI-982027, "Oyster Creek Nuclear Plant Emergency Isolation Tube Bundle Head Stress Analysis", Revision 0, 9/15/1998.

2. USTT&D Report, DAR 9808-4, "Design Report for Iso Condenser Tube Stress Analysis, (HOLTEC Report HI-92061)", 10/07/1998

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: May, Mike 12/20/2005

NRC Information Request Form

Reviewed By:	Getz, Stu	12/20/2005
Approved By:	Warfel, Don	12/20/2005
NRC Acceptance (Date):		

NRC Information Request Form

Item No
AMP-107

Date Received: 10/ 4/2005

Source AMP Audit

Status: Closed

Topic:
B.1.24 One Time Inspection

Document References:
B.1.24

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

One-Time Inspection (October 4, 2005)

B.1.24-6 Please clarify the process for selecting pipe inspection samples to ensure that different pipe sizes are included in the sample selection for Class 1 piping less than four inch nominal pipe size.

Assigned To: Miller, Mark

Response:

The one-time inspection for Class 1 piping for cracking initiation and growth due to thermal and mechanical loading, stress corrosion cracking, and intergranular stress corrosion cracking includes a representative sample of the susceptible items, and, where practical, focuses on the bounding or lead items most susceptible to cracking due to time in service, severity of operating conditions, or lowest design margin. The one-time inspection sample size will include 10% of the total butt welds in Class 1 piping under 4". The actual inspection locations will be based on physical accessibility, exposure levels, NDE techniques, etc. and will be determined by the site.

Based on the Oyster Creek Line List for RCPB systems, fittings <2.5 inch are socket weld ends. Fittings >=2.5 inch are butt weld ends. The sample population for One-Time Inspection of Class 1 piping < 4" NPS will therefore consist primarily of samples >=2.5 inch and less than 4 inch.

Examples from the line list are included in this response.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 10/ 5/2005

Reviewed By: Corsi, Lou 10/10/2005

NRC Information Request Form

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-108

Date Received: 10/ 4/2005

Source AMP Audit

Topic:
Reactor Head Closure Studs

Status: Closed

Document References:
B.1.3

NRC Representative Hsu, Robert

AmerGen (Took Issue): May, Mike

Question

AMP B.1.3 Reactor Head Closure Studs

In basis document, the applicant states the OC reactor head closure studs are constructed of ASME SA-193, GR. AISI 4340 material, which has a maximum tensile strength of less than 170 Ksi. Please provide documentation indicating what is the actual tensile strength.

Assigned To: May, Mike

Response:

A CMTR was provided to the NRC that confirmed that the head studs have a tensile strength of less than or equal to 170 ksi per Reg Guide 1.65.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: May, Mike 10/ 5/2005

Reviewed By: Getz, Stu 10/11/2005

Approved By: Warfel, Don 10/12/2005

NRC Acceptance (Date): 10/ 5/2005

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-109		10/ 4/2005	AMP Audit
		Status:	Closed

Topic:
Selected Leaching of Materials

Document References:
B.1.25

NRC Representative Davis, Jim

AmerGen (Took Issue): Micklo, Charl

Question

For AMP B.1.25, please provide an operating experience example regarding the pump replacement due to selective leaching.

Assigned To: Micklo, Charles

Response:

Oyster Creek has previously experienced selective leaching issues with the Service Water system and the Circulating Water system at the intake. Initially, the Service Water pump suction bowels were all made of cast iron. Submergence in the intake bay for years at a time caused severe graphitization of these bowls. This diagnosis was made at the time by a materials engineer on the staff of the pump company and was confirmed based on visual observation by the materials engineer of the previous plant owner.

At this time, cast iron is no longer used or specified for use in the submerged portions of the service water pumps. Replacement parts are constructed from corrosion resistant materials. Additionally, the Emergency Service Water pumps do not contain cast iron parts.

In the case of the circulating water pumps, the suction column sections (4) for each of the four pumps were all originally purchased with cast iron parts. Again, evidence of graphitic corrosion was found occurring early in their life. Steps were taken to replace the sections with new sections fabricated of stainless steel or carbon steel as deemed necessary. In addition, to prevent galvanic corrosion, insulation kits were installed between flanges where dissimilar metals met. At the present time, there remain a few sections still made of the original cast iron, but these are heavily coated. These sections are visually inspected by the repair facility during overhauls in which the pump is removed from service and shipped to them. The circulating water pumps are not within the scope of License Renewal.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

NRC Information Request Form

Approvals:

Prepared By:	Micklo, Charles	10/ 6/2005
Reviewed By:	Beck, George	12/20/2005
Approved By:	Warfel, Don	12/21/2005
NRC Acceptance (Date):		

NRC Information Request Form

Item No
AMP-110

Date Received: 10/ 4/2005

Source AMP Audit

Status: Closed

Topic:
Buried Piping Inspection

Document References:
B.1.26

NRC Representative Davis, Jim

AmerGen (Took Issue):

<u>Question</u>

For AMP B.1.26 Buried Piping Inspection, new Gall has the following statement in Element 4 It is anticipated that one or more opportunistic inspections may occur within a ten-year period. Prior to entering the period of extended operation, the applicant is to verify that there is at least one opportunistic or focused inspection is performed within the past ten years. Upon entering the period of extended operation, the applicant is to perform a focused inspection within ten years, unless an opportunistic inspection occurred within this ten-year period.

Does OC have a plan to perform one inspection prior to and one inspection after entering the extended operation to be consistent with the new GALL?

Assigned To: Rafferty-Czincila, Shannon

<u>Response:</u>

"Prior to entering the period of extended operation, the applicant is to verify that there is at least one opportunistic or focused inspection is performed within the past ten years"
- Oyster Creek has performed focused inspection on their underground piping within the past ten years. Reference TR-116, Rev. 1
- A copy of TR-116, Rev. 1 was provided 10/5/05.

"Upon entering the period of extended operation, the applicant is to perform a focused inspection within ten years, unless an opportunistic inspection occurred within this ten-year period."
- A draft PM is created as part of the enhancements & implementing procedures to the program that will direct the a focused inspection with in tens years after entering the period of extended operation.
- This Draft PM was provided 10/5/05.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

NRC Information Request Form

Prepared By:	Rafferty-Czincila, Shannon	10/ 5/2005
Reviewed By:	Corsi, Lou	10/11/2005
Approved By:	Warfel, Don	10/11/2005
NRC Acceptance (Date):	10/ 5/2005	

NRC Information Request Form

Item No
AMP-111

Date Received: 10/ 4/2005

Source AMP Audit

Status: Accepted by NRC

Topic:
Metal Fatigue

Document References:
B.3.1

NRC Representative Hsu, Robert

AmerGen (Took Issue):

<u>Question</u>

a. Element 4 of the GALL report states that the program provides for periodic update of the fatigue usage calculations. Please provide information to support that OCGS program does provide update.

b. Please provide documents to support the cycle counting activities prior to fatigue program installation.

c. Please provide the backup documents to support isolation condensers fatigue result and transient cycles.

d. Metal Fatigue Acceptance Criteria - On page 4-36, the applicant states the allowable CUF value is 1.0. The current design basis CUF for some components is 0.8. Please justify how 1.0 could be used since the current design basis is 0.8.

e. AMP B.3.1 Metal Fatigue Operating Experience - Please provide OCGS operating experience and evaluations associated with fatigue cracking.

Assigned To: May, Mike

<u>Response:</u>

a. As described in the Program Basis Document for the Metal Fatigue of the Reactor Coolant Pressure Boundary (PBD-AMP-B.3.01), the fatigue aging management program continuously monitors plant operational events, calculates usage factors for all monitored locations, and compares the accumulated data to allowable values. The responsible plant engineer collects the data approximately monthly. The data is reviewed to identify the need for any corrective actions. Semi-annually a report is generated for management that summarizes the transients and changes to fatigue usage incurred during the previous reporting period.

b. The current MFRCPB program is also described in PBD-AMP-B.3.01. The current MFRCPB program records thermal cycles on the Oyster Creek Transient / Cycle Summary Log, which is updated periodically. Plant operational data recorded by the Thermal Performance Engineer at

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Oyster Creek is periodically reviewed along with control room operator logs to determine if a transient meets the definition for a particular cycle type. All transients that meet the cycle type definition are added to the summary log. The plant corrective action program is also reviewed to provide input from various plant transients that may have occurred since the last summary update. The program will be enhanced to use FatiguePro to monitor thermal cycles and transients as a basis for monitoring fatigue. The results of the Oyster Creek Transient / Cycle Summary were used to establish a baseline. Not all of the plant transients needed for FatiguePro have been tracked by the Oyster Creek Transient / Cycle Summary Log. The cycle count for several transients for some components and systems had to be added, including those for the Isolation Condenser, EMRV, and Shutdown Cooling. Plant records from first operation were reviewed to determine the number of cycles incurred for each event from first operation to present. Records searches included operator logs, Event reports, LERs, plant surveillance test reports, monthly and annual reports and plant performance data. This data was combined with the Oyster Creek Transient/ Cycle Summary Log to form the baseline history for FatiguePro.

The history of thermal counting is provided in the following references:

1. Sargent & Lundy LLC Project No. 11324-016, "Oyster Creek Station – Unit 1 Operational Records Review for License Renewal," December 21, 2004.
2. SIA Report, SI Calculation No. OC-05Q-324, " FatiguePro Historical Baselining", 10/21/2005.

A copy of these references as well as the current Oyster Creek Transient / Cycle Summary Log is enclosed with this response.

c) The backup documents to support isolation condensers fatigue result cycles are provided as part of the answer to question AMP-106. Transients cycles are provided in the two references listed in (b) above.

d) The licensing basis for acceptable cummulative fatigue usage (CUF) for the reactor pressure vessel is currently stated in the Oyster Creek UFSAR to be 0.8. Oyster Creek is currently in the process of changing the CUF acceptance limit for the RPV to 1.0 using the approach described in 4.3.1 of the OC LRA. In summary, the approach will utilize provisions of ASME that permit fatigue usage for the RPV components to be re-evaluated in accordance with Non-Mandatory Appendix L, Article L-2000 of ASME Section XI (1995 Edition including the 1996 Addenda), portions of which have been accepted for use by the NRC. Article L-2000 provides guidance for operating plant fatigue issues, and allows the use of Editions and addenda of ASME, Section III later than the Construction Code to evaluate fatigue usage for operating plants where a fatigue issue has been identified. This approach has been approved through 10 CFR 50.55(a). Article L-2000 also establishes that a Reactor Coolant Pressure Boundary component is acceptable for continued service if the CUF is equal or less than 1.0.

e) PBD-AMP-B.3.01 also provides operating experience with fatigue at Oyster Creek. As described in Section 3.10 of PBD-AMP-B.3.01, in September of 1997 the Nine Mile Point Unit 1 Nuclear Power

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Plant experienced through-wall tube failures in all Emergency Condenser tube bundles. Subsequent failure investigation and root cause analysis concluded that thermal fatigue and corrosion were the failure mechanisms, resulting from partially exposing the tubes to a steam and condensate environment during standby mode for long period periods of time. Because the Oyster Creek and NMP Isolation condenser were designed essentially the same, Oyster Creek personnel took action to investigate for similar problems at Oyster Creek. Personnel at Oyster Creek suspected a similar problem might exist because high condenser shell side water temperatures were observed. Inspection and testing of the condenser also found tube failures in the Oyster Creek Isolation Condenser. The condenser tubes were replaced in 1998 and 2000 and isolation valve leakage corrected. Since these repairs were made, high temperatures or signs of tube leakage have not been observed. Because of the operating experience with Isolation Condenser fatigue at both NMP-1 and Oyster Creek the MFRCPB program will monitor locations on the Oyster Creek Isolation Condenser for fatigue usage, despite the fact that predicted fatigue usage factors for the Isolation Condenser are less than the 0.4 screening criterion for inclusion . This provides objective evidence that Oyster Creek Oyster Creek reviews industry experience with regard to fatigue issues, considers industry experience when selecting locations for monitoring fatigue, and takes corrective action before the loss of intended function.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: May, Mike 12/20/2005

Reviewed By: Getz, Stu 12/20/2005

Approved By: Warfel, Don 12/20/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-112

Date Received: 10/ 5/2005

Source AMP Audit

Status: Closed

Topic:
Flow Acceleration Corrosion

Document References:
B.1.11

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

AMP B.1.11 Element 5, Monitoring and Trending

Please provide an example of monitoring and trending using point-to-point method.

Assigned To: Miller, Mark

Response:

An example of point-to-point monitoring and trending of FAC data was provided 10/4/05 to requester. The Oyster Creek FAC Program Manager reviewed the document with W. Wang on 10/06/2005.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Miller, Mark 10/ 4/2005

Reviewed By: N/A

Approved By: Warfel, Don 10/11/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-113		10/ 5/2005	AMP Audit
Topic:		***Status:***	Closed

Compressed Air Monitoring (CAM) program B.1.17

Document References:

CAM 10 element

NRC Representative Villaran, Mike

AmerGen (Took Issue): Micklo, Charl

Question

Provide specific document number and section references of implementing activities to the GALL requirements. Specifically, Gall Item 5 response discusses air quality tests, pressure decay tests and visual inspections.

Assigned To: Micklo, Charles

Response:

The tests and inspections are implemented by two work order types.

For GALL elements 1 - 6, air quality measurements are implemented by work order PM 00081I (RT 0800446) "Instrument Air System Dew Point and Particulate"
PM Cover sheet Task Frequency 364 D (yearly)
Activity 1 steps:
1.1 Purpose "Periodically monitor air quality at several points throughout the instrument air system. System air quality ... should be maintained within the requirements of ISA standard ISA-S7.0.01- 1996."
6 .1 Work Details "A minimum of 4 samples must be taken." (Predefined sample points)
7.1 Post Maintenance Testing " ... Analyze samples per ISA-S7.0.01-1996 and provide a written report to Oyster Creek."

For GALL elements 1 - 6, leak testing and visual inspections are implemented by 28 work orders. An example for valve MSIV V-1-7 accumulator and piping is PM 00208I (RT 0800738) " V-1-7 GL 88-14 Inst Air Leak Test":
PM Cover sheet Task Frequency 0001 R (refuel outage)
Activity 1 steps:
1 Purpose A.2 "This inspection is in response to NRC GL 88-14"
7.A Scope "V-1-7 Pressure Decay Test" steps 1 - 14 performs test.
Sub step 8 "Accumulator pressure = ____"
9 "10 minutes after the first reading, again record accumulator pressure"
10 "If pressure drop is greater than 1.0 psig in the 10 minutes period, leak check

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(visually inspect) components .. , check solenoid and actuator"
8.B Post Maintenance Functional Stroke Test
9 Activity Completion "Document all work performed"

This response was discussed with K. Sullivan on 10/6 and a copy provided on 10/7. CM 10/7

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Micklo, Charles 10/ 7/2005

Reviewed By: Beck, George 12/20/2005

Approved By: Warfel, Don 12/21/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-114

Date Received: 10/ 5/2005

Source AMP Audit

Status: Closed

Topic:
Boraflex Rack Management Program

Document References:
B.1.15

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

Boraflex Rack Management Program

Element 7

Please provide a summary of CAP procedure LS-OC-125 to support corrective action element.

Assigned To: Ouaou, Ahmed

Response:

Procedure LS-OC-125, "Corrective Action Program (CAP) Procedure" and supporting documents implement Exelon Quality Assurance Topical Report (QATR), which is based on the 18 point criteria set forth in 10 CFR 50, Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants.

The procedure provides direction for using the CAP to address undesirable conditions and opportunities for improvement. The CAP process encompasses condition identification, condition documentation in a Condition Report (CR or CAP), assignment of significance level and investigation class, investigation, corrective action determination, root cause analysis, investigation report review and approval, action tracking, and trend analysis.

For Boraflex Rack Management Program (B.1.15), the CAP process is initiated if an adverse trend is identified in the peak % boron loss that would conservatively cause keff for the spent fuel in the storage racks to become equal to or rise above .95 (5% subcritical).

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 10/ 6/2005

NRC Information Request Form

Reviewed By:	Quintenz, Tom	10/ 6/2005
Approved By:	Warfel, Don	12/20/2005
NRC Acceptance (Date):		

NRC Information Request Form

Item No
AMP-115

Date Received: 10/ 5/2005

Source AMP Audit

Topic:
Reactor Head Closure Studs (Acceptance Criteria)

Status: Closed

Document References:
B.1.3

NRC Representative Hsu, Robert

AmerGen (Took Issue):

Question

In the basis document, the applicant states that an analytical evaluation is performed in accordance with IWB-3600 per procedure ER-AA-330-002. Please identify which part of IWB-3600 provides analytical evaluation for closure studs.

Assigned To: May, Mike

Response:

As stated in the Program Basis Document (PBD) for the Reactor Head Studs aging management program, PBD-B.1.03, any potential flaws are evaluated in accordance with ASME Section XI. PBD-B.1.03 states that Indications and relevant conditions detected during examinations are evaluated in accordance with ASME Section XI Subsection IWB-3100, for Class 1 components by comparing ISI results with the acceptance standards of IWB-3400 and IWB-3500. Specifically, Flaw indications or relevant conditions are evaluated in accordance with IWB-3515 or IWB-3517 as indicated in table IWB-2500-1 and Table 3410-1 of ASME Section XI. If the component qualifies as acceptable for continued service, the areas containing such flaw indications or relevant conditions shall be reexamined during the next three inspection periods.

Furthermore, OC procedures permit flaws that do not meet the criteria of IWB-3500 to be corrected by one of three possible measures: further evaluated in accordance with the requirements of ASME Section XI, IWB-3600; repair of the flaw; or replacement of the component. If a flaw were to be detected in a head stud at OC that did not meet the criteria of IWB-3500, it is unlikely that further evaluation in accordance IWB-3600 would be pursued as opposed to a repair or replacement of the head stud.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: May, Mike 12/20/2005

NRC Information Request Form

Reviewed By: Miller, Mark 12/20/2005

Approved By: Warfel, Don 12/20/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-116

Date Received: 10/ 5/2005

Source AMP Audit

Topic:
Thermal Aging & Neutron Irradiation Embrittlement of CASS

Status: Closed

Document References:
B.1.10

NRC Representative Hsu, Robert

AmerGen (Took Issue):

Question

In the basis document, OCGS states that each component will be evaluated based on its susceptibility to loss of fracture toughness in accordance with the requirements of procedure ER-AB-331-101.

a. Please provide the requirements in detail instead of referencing ER-AB-331-101.

AMP B.1.10 Thermal Aging & Neutron Irradiation Embrittlement of CASS

b. In the basis document, OCGS indicates that thermal aging threshold temperature is 550°F. Please clarify this issue since GALL report identifies 482°F as threshold temperature.

c. In the basis document, OCGS does not identify flaw evaluation for CASS components with >25% ferrite. Please confirm that OCGS does not have CASS component with >25% ferrite.

Assigned To: May, Mike

Response:

a) The details of the Oyster Creek Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel aging management program are provided in the Program Basis Document PBD-B.1.10, which recently has been provided to the NRC.

The Oyster Creek Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel aging management program provides screening criteria to determine the susceptibility of CASS reactor coolant pressure boundary and reactor internal components to thermal aging on the basis of casting method, molybdenum content, percent ferrite, and mechanical loading. Components determined to be susceptible to thermal aging or neutron embrittlement are managed by means of supplemental inspections.

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The Oyster Creek screening criteria are applicable to the primary coolant pressure boundary and reactor vessel internal components constructed from SA-351 Grades CF3, CF3A, CF8, CF8A, CF3M, CF3MA, CF8M, with service conditions above 250°C (482°F).

The Oyster Creek screening criteria for susceptibility to thermal aging embrittlement are not applicable to niobium-containing steels; such steels require evaluation on a case-by-case basis. For "potentially susceptible" components, the Oyster Creek Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel aging management program provides for the consideration of the synergistic loss of fracture toughness due to neutron embrittlement and thermal aging embrittlement. For each such component, Oyster Creek implements either (a) a supplemental examination of the affected component as part of the BWR Reactor Internals program during the license renewal term, or (b) a component-specific evaluation to determine the component's susceptibility to loss of fracture toughness.

Susceptibility to thermal aging embrittlement of Oyster Creek CASS components is determined in terms of casting method, molybdenum content, and ferrite content. For low-molybdenum content (0.5 wt.% max.) steels, only those static-cast steels with >20% ferrite are potentially susceptible to thermal embrittlement.

Static-cast low-molybdenum steels with 20% or greater ferrite and all centrifugal-cast low-molybdenum steels are not susceptible and will be excluded from the Oyster Creek Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel aging management program.

High-molybdenum content (2.0 to 3.0 wt.%) steels, static-cast steels with >14% ferrite and centrifugal-cast steels with >20% ferrite are potentially susceptible to thermal embrittlement and will be evaluated. Static-cast high-molybdenum steels with 14% or less ferrite and centrifugal-cast high-molybdenum steels with 20% or less ferrite are not susceptible and will be excluded from the Oyster Creek Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel aging management program.

In the Oyster Creek susceptibility screening, ferrite content is calculated by using the Hull's equivalent factors (described in NUREG/CR-4513, Rev. 1). As an alternative approach, a fracture toughness value of 255 kJ/m2 (1,450 in.-lb/in.2) at a crack depth of 2.5 mm (0.1 in.) may be used at Oyster Creek to differentiate between CASS materials that are nonsusceptible and those that are potentially susceptible to thermal aging embrittlement.

The scope of thermal/neutron embrittlement applies to all CASS reactor vessel internals in the scope for license renewal. These components include the fuel support pieces, base of the CRD guide tubes, and the core spray nozzle elbows.

Each component will be evaluated based on its susceptibility to loss of fracture toughness. The program performs an evaluation of cast austenitic stainless steel (CASS) components that may be susceptible to thermal aging/neutron embrittlement to determine whether loss of fracture toughness due to thermal aging/neutron embrittlement is occurring.

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For susceptible components, a mechanical loading evaluation will be performed to determine the maximum tensile loading on the component during ASME Code Level A, B, C, and D conditions. Unless the loading is compressive or low enough to preclude fracture (<5ksi), a supplemental inspection of the component will be performed. These visual inspections will be performed consistent with enhanced ASME Section XI VT-1 (EVT-1) visual inspection requirements. Enhanced visual inspection techniques will be consistent with those described in BWRVIP-03.

b) The Oyster Creek Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel aging management program reflects 482 degrees F as the threshold for thermal aging of CASS components. References to 550 degrees F in corporate procedures will be corrected as part of the revision process for procedures that implement LRA commitments.

c) Oyster Creek has not yet evaluated the reactor internal components that are constructed from cast austenitic stainless steel. These evaluations and any required inspections will be performed prior to the period of extended operation. As stated in PBD-AMP-B.1.10, any flaws identified in CASS components with >25% ferrite content will be evaluated on a case-by-case basis using plant-specific fracture toughness data.

LRCR #: ***LRA A.5 Commitment #:***

IR#: 330592.10.02

Approvals:

Prepared By: May, Mike 1/ 4/2006

Reviewed By: Beck, George 1/ 5/2006

Approved By: Warfel, Don 1/ 5/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-117

Date Received: 10/ 5/2005

Source AMP Audit

Status: Void

Topic:
AMP Generic Issue

Document References:
Various

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.1.3Reactor Head Closure Studs
B.1.2Water Chemistry
B.1.5BWR Feedwater Nozzle
B.1.8BWR Penetrations
B.1.10Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS)
B.1.11Flow-Accelerated Corrosion
B.1.13Open-Cycle Cooling Water System
B.1.14Closed-Cycle Cooling Water System
B.1.17Compressed Air Monitoring
B.1.34Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements
B.1.35Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits
B.1.36Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements
B.3.1Metal Fatigue of Reactor Coolant Pressure Boundary
B.3.2Environmental Qualification (EQ) Program
B.1.20 Fire Water
B.1.19 Fire Protection

Assigned To: Warfel, Don

Response:

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This item is voided because the program documents were individually assigned per Don Warfel except B.1.20 and B.1.19 which did not have separate items generated but PBD's were generated.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 12/ 6/2005

Reviewed By: N/A

Approved By: Warfel, Don 12/ 7/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-118

Date Received: 10/ 5/2005

Source AMP Audit

Status: Closed

Topic:
ASME Section XI, Subsection IWE

Document References:
B.1.27

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP B.1.27

In discussions with the applicant's staff on 10/04/05 about IWE, it was indicated that a special coating is applied, prior to flooding the reactor for refueling, to prevent leakage into the annular space between the drywell shell and the concrete shield wall. As a result, water intrusion into the annular space has been eliminated as a source for further degradation on the exterior surface of the drywell shell.

The applicant is requested to specifically identify whether it is committed to continue the use of this refueling procedure through the extended period of operation. If not, please identify what enhanced inspections will be conducted during the extended period of operation, in order to monitor potential corrosion on the drywell exterior surface, from the upper flange region to the sandbed region.

Assigned To: Ouaou, Ahmed

Response:

The coating applied to the reactor cavity prior to refueling was not credited in the license renewal application as an aging management activity for managing loss of material due to corrosion on the exterior surfaces of the drywell. The coating was considered one of the many good practices implemented during the current term to minimize water intrusion in the annular space between the drywell shell and the drywell shield wall. The coating also facilitates decontamination of the reactor cavity post refueling. AmerGen considers the credited ASME Section XI, Subsection IWE (B.1.27), 10 CFR 50 Appendix J (B.1.29), and the Protective Coating Monitoring and Maintenance Program (B.1.33) which is credited for monitoring protective coatings on the exterior surfaces of the drywell shell in the sand bed region adequate to manage corrosion of the drywell shell. However the strippable coating has been effective in mitigating water intrusion into the annular space and reducing the rate of corrosion. AmerGen therefore is commited to applying the strippable coating to the reactor cavity prior to flooding for refueling during the period of extended operation. This constitutes a new commitment no previously identified in the LRA.

NRC Information Request Form

The response was revised to commit to applying strippable coating prior to flooding the drywell cavity for refueling during the period of extended operation as discussed with NRC Audit team on 1/26/2006.

LRCR #: 229 *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By:	Ouaou, Ahmed	1/31/2006
Reviewed By:	Quintenz, Tom	2/ 7/2006
Approved By:	Warfel, Don	2/ 7/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-119

Date Received: 10/ 5/2005

Source AMP Audit

Status: Closed

Topic:
BWR Stress Corrosion Cracking

Document References:
B.1.7-5

NRC Representative Subudhi, Mano

AmerGen (Took Issue):

Question

B.1.7-5 The acceptance criteria element for OCGS AMP B.1.7 does not reference BWRVIP-14, -59, -60, -61, or -62. Please confirm that the acceptance criteria element for this OCGS AMP are consistent with the guidance in these documents.

Assigned To: Rafferty-Czincila, Shannon

Response:

The acceptance criteria element for B.1.7, BWR Stress Corrosion Cracking, is consistent with the guidelines of BWRVIP 14, 59, 60, 61, and 62.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Harttraft, Greg 10/ 6/2005

Reviewed By: Rafferty-Czincila, Shannon 10/11/2005

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-120

Date Received: 10/ 5/2005

Source AMP Audit

Status: Closed

Topic:
ASME Section XI ISI IWB, IWC, IWD

Document References:
B.1.1

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

B.1.1-10 The corrective action element for OCGS AMP B.1.1 states that replacements are performed according to IWB-7000, IWC-7000, and IWD-7000. However, these subsections are not included in the 1995 edition of ASME Section XI. Please clarify this discrepancy. This also applies to other OCGS AMPs, including B.1.5, B.1.6, and B.1.7.

Assigned To: Getz, Stu

Response:

GALL states that for Class 1, 2, and 3, respectively, repair is in conformance with IWB-4000, IWC-4000, and IWD-4000, and replacement according to IWB-7000, IWC-7000, and IWD-7000. This is not correct, as the 1995 Edition of the ASME Section XI Code has incorporated the repair and replacement requirements for Class 1, 2, and 3 components in Article IWA-4000. This is stated in Code Articles IWB-3000 and IWC-3000. (Article IWD-3000 of the Code is in the course of preparation, and states that the rules of IWB-3000 may be used.) The Oyster Creek basis for repair and replacement in AMP B.1.1 was repeated from the GALL corrective action requirement. However, in accordance with the 1995 Edition of the Section XI Code, Oyster Creek AMP B.1.1 performs repairs and replacements in accordance with the requirements of IWA-4000. This also applies to AMPs B.1.5, B.1.6, and B.1.7.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Getz, Stu 10/ 6/2005

Reviewed By: Miller, Mark 10/11/2005

Approved By: Warfel, Don 10/12/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

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Item No		***Date Received:***	***Source***
AMP-121		10/ 6/2005	AMP Audit
Topic:		***Status:***	Closed
AMP Generic Appendix B			

Document References:
Generic Appendix B

NRC Representative Morante, Rich

AmerGen (Took Issue): Fulvio, Al

Question

The OCGS LRA, Appendix B, identifies enhancements for many existing programs and also identifies a number of new programs, for inspection of components/aging effects that are not currently monitored. The applicant indicates that enhancements and new programs will be in place prior to entering the extended period of operation.
In discussions with the applicant's staff on 10/04/05 related to IWF, it was stated that the first inspections for the enhancements would be conducted prior to entering the extended period of operation. It was further indicated that this is the case for all enhancements to existing AMPs.
To clarify the applicant's commitments, please provide the following information:
Confirm that all inspections identified in enhancements to existing programs or in new programs will be conducted prior to entering the extended period of operation.

Assigned To: Fulvio, Al

Response:

Many LRA Appendix A program descriptions and LRA Appendix B sections state "Enhancements to the program will be implemented prior to the period of extended operation."
The same implementation schedule statements are contained in the LRA Section A.5 License Renewal Commitment List table for these programs.
These statements mean that the required procedural enhancements and the associated implementing activities will be completed prior to the period of extended operation.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Fulvio, Al 10/ 6/2005

Reviewed By: N/A

NRC Information Request Form

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-122

Date Received: 10/ 5/2005

Source AMP Audit

Topic:
Reactor Head Closure Studs

Status: Void

Document References:
B.1.3

NRC Representative Hsu, Robert

AmerGen (Took Issue):

Question

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.1.3 Reactor Head Closure Studs

Assigned To: May, Mike

Response:

For each program element that references procedures as the bases for consistency with GALL, the descriptions of the OCGS specific attributes (i.e. methods, descriptive processes used) that are credited for demonstrating consistency with its GALL recommendations will be provided in Aging Management Program Bases Document provided in AMP-147.
This is a duplicate of information to be provided in AMP-147.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 12/ 6/2005

Reviewed By: N/A

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No
AMP-123

Date Received: 10/ 5/2005

Source AMP Audit

Status: Void

Topic:
Water Chemistry

Document References:
B.1.2

NRC Representative Subudhi, Mano

AmerGen (Took Issue):

Question

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.1.2 Water Chemistry

Assigned To: Rafferty-Czincila, Shannon

Response:

For each program element that references procedures as the bases for consistency with GALL, the descriptions of the OCGS specific attributes (i.e. methods, descriptive processes used) that are credited for demonstrating consistency with its GALL recommendations will be provided in Aging Management Program Bases Document provided in AMP-147.
This is a duplicate of information to be provided in AMP-147.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 12/ 6/2005

Reviewed By: N/A

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No
AMP-124

Date Received: 10/ 5/2005

Source AMP Audit

Status: Void

Topic:
BWR Feedwater Nozzle

Document References:
B.1.5

NRC Representative Subudhi, Mano

AmerGen (Took Issue):

<u>Question</u>

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.1.5 BWR Feedwater Nozzle

Assigned To: May, Mike

<u>Response:</u>

For each program element that references procedures as the bases for consistency with GALL, the descriptions of the OCGS specific attributes (i.e. methods, descriptive processes used) that are credited for demonstrating consistency with its GALL recommendations will be provided in Aging Management Program Bases Document provided in AMP-147.
This is a duplicate of information to be provided in AMP-147.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: Corsi, Lou 12/ 6/2005

Reviewed By: N/A

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No
AMP-125

Date Received: 10/ 5/2005

Source AMP Audit

Status: Void

Topic:
BWR Penetrations

Document References:
B.1.8

NRC Representative Subudhi, Mano

AmerGen (Took Issue):

Question

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.1.8 BWR Penetrations

Assigned To: May, Mike

Response:

For each program element that references procedures as the bases for consistency with GALL, the descriptions of the OCGS specific attributes (i.e. methods, descriptive processes used) that are credited for demonstrating consistency with its GALL recommendations will be provided in Aging Management Program Bases Document provided in AMP-147.
This is a duplicate of information to be provided in AMP-147.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 12/ 6/2005

Reviewed By: N/A

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No		*Date Received:*	*Source*
AMP-126		10/ 5/2005	AMP Audit
		Status:	Void

Topic:
Thermal Aging and Neutron Irradiation of CASS

Document References:
B.1.10

NRC Representative Hsu, Robert

AmerGen (Took Issue):

Question

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.1.10 Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS)

Assigned To: May, Mike

Response:

For each program element that references procedures as the bases for consistency with GALL, the descriptions of the OCGS specific attributes (i.e. methods, descriptive processes used) that are credited for demonstrating consistency with its GALL recommendations will be provided in Aging Management Program Bases Document provided in AMP-147.
This is a duplicate of information to be provided in AMP-147.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Corsi, Lou 12/ 6/2005

Reviewed By: N/A

Approved By: Warfel, Don 1/ 6/2006

NRC Information Request Form

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-127

Date Received: 10/ 5/2005

Source AMP Audit

Status: Closed

Topic:
Flow Accelerated Corrosion

Document References:
B.1.11

NRC Representative Mathew, Roy

AmerGen (Took Issue):

<u>Question</u>

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.1.11 Flow Accelerated Corrosion

Assigned To: Miller, Mark

<u>Response:</u>

The 10-element review for AMP B.1.11, "Flow-Accelerated Corrosion" was revised (to Revision 1) to include the OCGS specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation. This document was provided to W. Wang both in hardcopy and in electronic form on 10/06/2005.

For each program element that references procedures as the bases for consistency with GALL, the descriptions of the OCGS specific attributes (i.e. methods, descriptive processes used) that are credited for demonstrating consistency with its GALL recommendations will be provided in Aging Management Program Bases Document provided in AMP-147.
This is a duplicate of information to be provided in AMP-147.

LRCR #: 207 ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: Miller, Mark 10/ 6/2005

NRC Information Request Form

Reviewed By:	N/A	10/10/2005
Approved By:	Warfel, Don	10/ 7/2005
NRC Acceptance (Date):	10/ 6/2005	

NRC Information Request Form

Item No
AMP-128

Date Received: 10/ 5/2005

Source AMP Audit

Status: Void

Topic:
Open Cycle Cooling Water System

Document References:
B.1.13

NRC Representative Villaran, Mike

AmerGen (Took Issue):

Question

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.1.13 Open Cycle Cooling Water System

Assigned To: Rafferty-Czincila, Shannon

Response:

For each program element that references procedures as the bases for consistency with GALL, the descriptions of the OCGS specific attributes (i.e. methods, descriptive processes used) that are credited for demonstrating consistency with its GALL recommendations will be provided in Aging Management Program Bases Document provided in AMP-147.
This is a duplicate of information to be provided in AMP-147.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Corsi, Lou 12/ 6/2005

Reviewed By: N/A

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No
AMP-129

Date Received: 10/ 5/2005

Source AMP Audit

Status: Void

Topic:
Closed Cycle Cooling Water System

Document References:
B.1.14

NRC Representative Villaran, Mike

AmerGen (Took Issue):

Question

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.1.14 Closed Cycle Cooling Water System

Assigned To: Rafferty-Czincila, Shannon

Response:

For each program element that references procedures as the bases for consistency with GALL, the descriptions of the OCGS specific attributes (i.e. methods, descriptive processes used) that are credited for demonstrating consistency with its GALL recommendations will be provided in Aging Management Program Bases Document provided in AMP-147.
This is a duplicate of information to be provided in AMP-147.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Corsi, Lou 12/ 6/2005

Reviewed By: N/A

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No
AMP-130

Date Received: 10/ 5/2005

Source AMP Audit

Status: Void

Topic:
Compressed Air Monitoring

Document References:
B.1.17

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.1.17 Compressed Air Monitoring

Assigned To: Micklo, Charles

Response:

This issue had been previously identified and discussed with Ken Sullivan and entered as AMP-113. Please refer to AMP-113 for response. 10/6/2005

Subsequently, this information is fully presented in the Compressed Air Monitoring Program Basis Document, PBD-AMP-B.1.17, rev 0. 11/17/05

For each program element that references procedures as the bases for consistency with GALL, the descriptions of the OCGS specific attributes (i.e. methods, descriptive processes used) that are credited for demonstrating consistency with its GALL recommendations will be provided in Aging Management Program Bases Document provided in AMP-147.
This is a duplicate of information to be provided in AMP-147.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Micklo, Charles	11/17/2005
Reviewed By:	N/A	
Approved By:	Warfel, Don	12/20/2005
NRC Acceptance (Date):		

NRC Information Request Form

Item No
AMP-131

Date Received: 10/ 5/2005

Source AMP Audit

Status: Closed

Topic:
Electrical Cables and Connections

Document References:
B.1.34

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.1.34 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

Assigned To: Spamer, Deb

Response:

Program Basis Document PBD-AMP-B.1.34 addresses this generic issue. DMS 11/17/05

For each program element that references procedures as the bases for consistency with GALL, the descriptions of the OCGS specific attributes (i.e. methods, descriptive processes used) that are credited for demonstrating consistency with its GALL recommendations will be provided in Aging Management Program Bases Document provided in AMP-147.
This is a duplicate of information to be provided in AMP-147.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Spamer, Deb 12/20/2005

Reviewed By: N/A

NRC Information Request Form

Approved By: Warfel, Don 12/20/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-132

Date Received: 10/ 5/2005

Source AMP Audit

Status: Void

Topic:
Electrical Cables and Connections

Document References:
B.1.35

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.1.35 Electrical Cables and Connections not Subject to 10 CFR 50.49 Environmental Qualification Reguirements used in Instrumentation Circuits

Assigned To: Spamer, Deb

Response:

Program Basis Document PBS-AMP-B.1.35 addresses this generic issue. DMS 12/01/05

For each program element that references procedures as the bases for consistency with GALL, the descriptions of the OCGS specific attributes (i.e. methods, descriptive processes used) that are credited for demonstrating consistency with its GALL recommendations will be provided in Aging Management Program Bases Document provided in AMP-147.
This is a duplicate of information to be provided in AMP-147.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Corsi, Lou 12/ 6/2005

Reviewed By: N/A

NRC Information Request Form

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-133

Date Received: 10/ 5/2005

Source AMP Audit

Status: Void

Topic:
Inaccessible Medium Voltage Cables

Document References:
B.1.36

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.1.36 Inaccessible Medium Voltage Cables not Subject to 10 CFR 50.49 Environmental Qualification Requirements

Assigned To: Spamer, Deb

Response:

Program Basis Document PBD-AMP-B.1.36 addresses this generic issue. DMS 12/8/05

For each program element that references procedures as the bases for consistency with GALL, the descriptions of the OCGS specific attributes (i.e. methods, descriptive processes used) that are credited for demonstrating consistency with its GALL recommendations will be provided in Aging Management Program Bases Document provided in AMP-147.
This is a duplicate of information to be provided in AMP-147.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 12/ 6/2005

Reviewed By: N/A

NRC Information Request Form

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-134

Date Received: 10/ 5/2005

Source AMP Audit

Topic:
Metal Fatigue

Status: Void

Document References:
B.3.1

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.3.1 Metal Fatigue of Reactor Coolant Pressure Boundary

Assigned To: May, Mike

Response:

For each program element that references procedures as the bases for consistency with GALL, the descriptions of the OCGS specific attributes (i.e. methods, descriptive processes used) that are credited for demonstrating consistency with its GALL recommendations will be provided in Aging Management Program Bases Document provided in AMP-147.
This is a duplicate of information to be provided in AMP-147.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 12/ 6/2005

Reviewed By: N/A

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No
AMP-135

Date Received: 10/ 5/2005

Source AMP Audit

Topic:
Environmental Qualification (EQ) Program

Status: Void

Document References:
B.3.2

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

For the Aging Management Programs identified below, the OC basis documents refer to a number of documents as a means of demonstrating consistency to specific recommendations defined in the GALL Program elements.

For each program element that references procedures as the basis for consistency with GALL, please provide the descriptions of the OCGS' specific attributes (i.e., methods, descriptive processes used) that are credited for demonstrating consistency with the GALL recommendation.

B.3.2 Environmental Qualification (EQ) Program

Assigned To: May, Mike

Response:

For each program element that references procedures as the bases for consistency with GALL, the descriptions of the OCGS specific attributes (i.e. methods, descriptive processes used) that are credited for demonstrating consistency with its GALL recommendations will be provided in Aging Management Program Bases Document provided in AMP-147.
This is a duplicate of information to be provided in AMP-147.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 12/ 6/2005

Reviewed By: N/A

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No
AMP-136

Date Received: 10/ 6/2005

Source AMP Audit

Topic:
B.1..34 - % of Inaccessible Versus Accessible Cables

Status: Closed

Document References:

NRC Representative Mathew, Roy

AmerGen (Took Issue): Spamer, Deb

Question

For cables exposed to adverse localized environments and general ambient conditions that exceed cable design limits, what is the percentage of these cables that are accessible?

Assigned To: Spamer, Deb

Response:

It is estimated that most of the cables and connections exposed to adverse localized environments and general ambient conditions that exceed cable design limits are accessible. It was agreed, by Linh Tran, that a specific per centage was not required for this answer.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 10/ 6/2005

Reviewed By: Honan, Dave 10/17/2005

Approved By: Polaski, Fred 12/13/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-137

Date Received: 10/ 6/2005

Source AMP Audit

Status: Closed

Topic:
B.1.36 - Locations of Medium Voltage Cables

Document References:

NRC Representative Mathew, Roy

AmerGen (Took Issue): Spamer, Deb

Question

For the 47 cables in the scope of B.1.36, provide the following information:
- How many are currently located underground?
- How many have been raised in elevation, yet still remain underground?
- How many have been rerouted above ground?
- How many that are currently underground are planned for future reroute to a raised elevation or above ground location?

Assigned To: Spamer, Deb

Response:

31 cables are currently located underground.

2 Unit Substations (1A2 and 1B2) cables were rerouted and are at the top of the sand bed in the turbine building basement.

2 cables, one for Unit Substation 1B1 and one for the B condensate pump were rerouted above ground.

Future reroutes of 2 cables, to above ground locations, have been planned for refuel outage 1R21 in 2006. These two cables are for the 2C feedwater and C condensate pump motors.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Spamer, Deb 1/ 9/2006

Reviewed By: Honan, Dave 1/ 9/2006

NRC Information Request Form

Approved By: Warfel, Don 1/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-138

Date Received: 10/ 6/2005

Source AMP Audit

Status: Closed

Topic:
Open Cycle Cooling Water

Document References:
B.1.13

NRC Representative Villaran, Mike

AmerGen (Took Issue):

<u>Question</u>

GALL AMP: XI.M20 Open Cycle Cooling Water

AMP B.1.13, Rev 2 New Pipe Test Frequencies: Open Cycle Cooling Water

The OC LRA states that the Open-Cycle Cooling Water System aging management program is an existing program that is consistent with the elements of aging program XI.M20, Open-Cycle Cooling Water System, specified in NUREG-1801.

GALL Element, 5 Monitoring and Trending, requires testing frequencies to be in accordance with the utility commitments under NRC GL 89-13. The GPU response to GL 89-13, Recommended Action III, states that UT tests on the uncoated portions of the piping are performed each refueling outage.

The OC LRA basis/alignment document for GALL Element 3 states that for aboveground piping that is original to the plant design, UT inspections are performed every 2 years which is consistent with OC GL 89-13 commitments.

For new pipe, however, inspections are performed every four years, which is not consistent with the GALL Element 5 criterion. The extended inspection interval for new pipe is identified as an enhancement in the LRA.

Please provide: (1) a technical justification for the extended inspection frequency for new pipe and (2) a justification as to why the extended test frequency for new pipe is not considered an exception to GALL Element 5.

Assigned To: Rafferty-Czincila, Shannon

<u>Response:</u>

The technical justification for the extended inspection frequency for new pipe is that in the GPU Nuclear response to GL 89-13, date January 30, 1990, under GPUN Response to Recommended Action I, it is stated that, "The affected open cycle service water system, per the criteria of GL 89-13,

consists of the Emergency Service Water (ESW) System." Therefore, the scope of these inspections, as committed to in the GPUN response to GL 89-13, applies to only the ESW system. Furthermore the GPU Response to Recommended Action III stated that, "The majority of the ESW piping has an internal protective coating. GPUN has established a program which requires ultrasonic test measurements to be performed on the uncoated portions of the piping each refueling outage." All of the new piping that is and will be install is coated internally. Therefore it is not required, per the GPU response that the new piping, which is already coated internally, be ultrasonically tested every refueling outage.

The justification as to why the extended test frequency for new pipe is not considered an exception to GALL Element 5 is that the GL 89-13 NRC Recommended Action III states: "Ensure by establishing a routine inspection and maintenance program for open-cycle service water system piping and components that corrosion, erosion, protective coating failure, silting, and biofouling cannot degrade performance of the safety related systems supplied by service water." There is no mention of a specific inspection/testing frequency. Therefore the inspections of the new piping every four years meets the "routine inspection" criteria required by the NRC Recommended Action III and an exception to GALL Element 5 is not required.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 1/ 4/2006

Reviewed By: Miller, Mark 1/ 6/2006

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date): 1/27/2006

NRC Information Request Form

Item No
AMP-139

Date Received: 10/ 6/2005

Source AMP Audit

Status: Closed

Topic:
Silt Removal Open Cycle Cooling Water

Document References:
B.1.13

NRC Representative Villaran, Mike

AmerGen (Took Issue):

Question

AMP B.1.13, Rev. 2 Silt Removal: Open Cycle Cooling Water

The OC LRA states that the Open-Cycle Cooling Water System aging management program is an existing program that is consistent with the elements of aging program XI.M20, Open-Cycle Cooling Water System, specified in NUREG-1801.

GALL Element, 3 Parameters Monitored / Inspected, requires the OCCW AMP to include measures to ensure the removal of accumulations of biofouling agents, corrosion products and silt. For this Element criterion, the OC LRA basis/alignment document appears to credit ESW and SW operability tests as a means of demonstrating consistency with this criterion.

Reliance on operability tests in lieu of periodic removal of biofouling agents, corrosion products and silt is an exception to GALL criteria. If this is the case, please provide: (1) a technical justification for performing operability tests in lieu of ensuring that accumulations of biofouling agents, corrosion products and silt are removed and (2) a justification as to why reliance on operability testing in lieu of removal is not considered

Assigned To: Rafferty-Czincila, Shannon

Response:

Operability tests are not relied on in lieu of periodic removal of biofouling agents, corrosion products and silt. Cleaning and inspections ensure that accumulation of biofouling agents, corrosion products and silt are removed. Removal of accumulations of biofouling agents, corrosion products, and silt are performed via cleaning and inspections. The RBCCW & TBCCW heat exchangers are cleaned and inspected annually. (Reference: PM00120M, PM00184M & PM00209M PM00189M) The Containment Spray heat exchangers are cleaned and inspected every 3 years. (Reference: PM00116M & PM00118M) Additionally, operability tests and other monitoring provide verification that biofouling agents, corrosion products and silt buildup is not preventing the system from performing its safety function. The ESW & SW systems are tested for operability on a quarterly basis, which would ensure that biofouling agents, corrosion products and silt build up, is not preventing the systems from

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performing their intended functions. (Reference: 607.4.016, 607.4.017, 641.4.001) The RBCCW & TBCCW heat exchangers differential pressures are monitored when the systems are in service, which ensures that biofouling agents, corrosion products and silt build up, is not preventing the systems from performing their intended functions. Furthermore, the procedures for monitoring the RBCCW & TBCCW systems state that cleaning of the heat exchangers is to be scheduled if the differential pressure exceeds the set limit. (Reference: 322 and 309.1)

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 1/ 4/2006

Reviewed By: Corsi, Lou 1/ 6/2006

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date): 1/27/2006

NRC Information Request Form

Item No
AMP-140

Date Received: 10/ 6/2005

Source AMP Audit

Status: Closed

Topic:
Open Cycle Cooling Water

Document References:
B.1.13

NRC Representative Villaran, Mike

AmerGen (Took Issue):

Question

GALL AMP: XI.M20 Open Cycle Cooling Water

Test Frequencies: Open Cycle Cooling Water B.1.13, Rev. 2

The OC LRA states that the Open-Cycle Cooling Water System aging management program is an existing program that is consistent with the elements of aging program XI.M20, Open-Cycle Cooling Water System, specified in NUREG-1801.

GALL Element, 5 Monitoring and Trending, requires testing frequencies to be in accordance with the utility commitments under NRC GL 89-13. The GPU response to GL 89-13 Recommended Action III states that UT tests on the uncoated portions of the piping are performed each refueling outage. The OC LRA basis/alignment document for GALL Element 5 states the periodicity of the testing and inspections are based on previous findings and are continually adjusted accordingly.

The adjustment of testing intervals due to specific inspection results appears to be an exception to NUREG-1801 Element 5 criterion concerning test frequencies. Please provide: (1) justification as to why the test frequency is not considered an exception to GALL Element 5 and (2) a technical justification for the stated test frequency

Assigned To: Rafferty-Czincila, Shannon

Response:

The justification as to why the test frequency is not considered an exception to GALL Element 5 is that in the GPU Nuclear response to GL 89-13, date January 30, 1990, under GPUN Response to Recommended Action I, it is stated that, "The affected open cycle service water system, per the criteria of GL 89-13, consists of the Emergency Service Water (ESW) System." Therefore, the scope of these inspections, as committed to in the GPUN response to GL 89-13, applies to only the ESW system. Furthermore the GPU Response to Recommended Action III stated that, "The majority of the ESW piping has an internal protective coating. GPUN has established a program which requires ultrasonic test measurements to be performed on the uncoated portions of the piping each refueling

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outage." All of the new piping that is and will be install is coated internally. Therefore it is not required, per the GPU response that the new piping, which is already coated internally, be ultrasonically tested every refueling outage. Additionally, the GL 89-13 NRC Recommended Action III states: "Ensure by establishing a routine inspection and maintenance program for open-cycle service water system piping and components that corrosion, erosion, protective coating failure, silting, and biofouling cannot degrade performance of the safety related systems supplied by service water." There is no mention of a specific inspection/testing frequency. Therefore as long as there is a regular inspection schedule established the program meets the "routine inspection" criteria required by the NRC Recommended Action III and an exception to GALL Element 5 is not required.

The technical justification for the stated frequency is that the current 2 year inspection frequency is based on plant and industry operating experience which is acceptable per the GL 89-13 guidance. The new 4 year inspection frequency for new piping is based on the fact that the new piping is installed with a new and improved coating system that will prevent degradation better than the old coating system. Furthermore, the ability to evaluate and modify inspection frequencies allows for the adjustment of the 4 year frequency to a more frequent inspection program if it is determined that the 4 year is not adequate. The statement: "The periodicity of the testing and inspections are based on previous findings and are continually adjusted accordingly" is meant to show that the results of the inspections are evaluated and if testing and inspections need to be more frequent, or the scope needs to be increased, then the program allows for this adjustment.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 1/ 4/2006

Reviewed By: Miller, Mark 1/ 6/2006

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date): 1/27/2006

NRC Information Request Form

Item No
AMP-141

Date Received: 10/ 6/2005

Source AMP Audit

Status: Open

Topic:
IWE

Document References:
B.1.27

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

<u>Question</u>

AMP B.1.27 IWE

a. Visual inspection of the coatings in the former sandbed region of the drywell is currently conducted under the applicant's protective coatings monitoring and maintenance program; only this AMP is credited for managing loss of material due to corrosion for license renewal. Visual inspection of the containment shell conducted in accordance with the requirements of IWE is typically credited to manage loss of material due to corrosion.

The applicant is requested to provide its technical basis for not also crediting its IWE program for managing loss of material due to corrosion in the former sandbed region of the drywell.

B. During discussions with the applicant's staff on 10/04/05 about augmented inspection conducted under IWE, the applicant presented tabulated inspection results obtained from the mid 1980s to the present, to monitor the remaining drywell wall thickness in the cylindrical and spherical regions where significant corrosion of the outside surface was previously detected.

The applicant is requested to provide (1) a copy of these tabulated inspection results, (2) a list of the nominal design thicknesses in each region of the drywell, (3) a list of the minimum required thicknesses in each region of the drywell, and (4) a list of the projected remaining wall thicknesses in each region of the drywell in the year 2029.

AMP B.1.27 IWE Question on Remaining Wall Thickness in the Former Sandbed Region of the Drywell

c. During discussions with the applicant's staff on 10/05/05, the applicant described the history and resolution of corrosion in the sandbed region. After discovery, thickness measurements were taken from 1986 through 1992, to monitor the progression of wall loss. Remedial actions were completed in early 1993. At that time, the remaining wall thickness exceeded the minimum required thickness. The applicant concluded that it had completely corrected the conditions which led to the corrosion, and terminated its program to monitor the remaining wall thickness. At that time, the remaining years of operation was expected to be no more than 16 years (end of the current license term).

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The applicant's aging management commitment for license renewals is limited to periodic inspection of the coating that was applied to the exterior surface of the drywell as part of the remedial actions. The applicant has not made a license renewal commitment to measure wall thickness in the sandbed region in order to confirm the effectiveness of the remedial actions taken.

Assigned To: Ouaou, Ahmed

Response:

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:

Reviewed By:

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-142

Date Received: 10/ 6/2005

Source AMP Audit

Status: Closed

Topic:
Core Spray Hangers - Action to prevent recurrence

Document References:
B.1.28

NRC Representative Morante, Rich

AmerGen (Took Issue): Corsi, Lou

Question

Core Spray System ISI CAP's indicate problems with supports dating back to 2000. The applicant is requested to provide information on corrective action taken to prevent recurrence.

Assigned To: Corsi, Lou

Response:

Core Spray had a long history of hydraulic transients, which over the years caused support damage of various degrees. Below are some of the corrective actions taken, which mitigated these concerns. The support failures found since 2000, were probably old failures, which occurred prior to the implementation of these corrective actions.

1. Installation of a Keep Full system
2. Installation of Frequency Controllers on the Test Valves V-20-26 and V-20-27, which slow down the opening stroke.
3. Modification of the pump recirculation piping to provide a continuous venting path and minimize the risk of piping voiding.
4. Implemented weekly PM to verify the system is filled and vented.
5. Modification of the counter weight assisted check valves (i.e., V-20-51 and V-20-52) to minimize the risk of sticking open. They were converted to regular swing check valves after malfunctioning of V-20-51 was determined to be the root cause for some water hammer transients experienced in Core Spray System 2 .

All the deficient supports found during 1R20 (2004) are scheduled for re-inspection during 1R21 (2006) .

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Corsi, Lou	10/ 6/2005
Reviewed By:	Miller, Mark	10/10/2005
Approved By:	Warfel, Don	10/ 6/2005

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No
AMP-143

Date Received: 10/ 6/2005

Source AMP Audit

Status: Closed

Topic:
Inaccessible Medium Voltage Cables

Document References:
B.1.36

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

Given the history of failures for underground cables at OCGS, even though GALL recommends a 10-year testing frequency, please provide a technical basis for why a ten-year testing frequency is still acceptable at OCGS.

Assigned To: Spamer, Deb

Response:

Currently, Oyster Creek implements a medium voltage cable testing program for Oyster Creek 5kV cables. The intent of the program is to identify the potential for cable failure and implement a replacement prior to failure. Testing has been completed for all forty-seven Oyster Creek 2.3kV and 4.1kV cables. Thirty-eight of the forty-two 4.1kV cables have been tested using a new test methodology by DTE that performs an online detection of partial discharge methodology. Eighteen were tested in 2004 and twenty were tested in 2005 using the DTE methodology. The remaining 2.3kV and 4.1kV cables have had their insulation integrity tested via step (from 1kV to 10kV) voltage testing.

Additionally, Oyster Creek has replaced approximately 75% of its original 5kV cables.

The existing cable testing program and extensive cable replacements demonstrate Oyster Creek's heightened attention to medium voltage cable issues and provides technical support for a GALL compliant testing frequency of 10 years for Oyster Creek AMP 1.36.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Spamer, Deb	10/ 6/2005
Reviewed By:	Honan, Dave	10/17/2005
Approved By:	Warfel, Don	12/13/2005
NRC Acceptance (Date):		

NRC Information Request Form

Item No
AMP-144

Date Received: 10/ 6/2005

Source AMP Audit

Topic:
Use of procedure references in AMP descriptions

Status: Closed

Document References:

NRC Representative Mathew, Roy

AmerGen (Took Issue): Warfel, Don

Question

Please clarify the use of procedure references in the Aging Management Program documents that are used to implement GALL recommendations. For example,
a. Aging Management Program B.1.3, Reactor Head Closure Studs, element 6, and B.1.4, BWR Vessel ID Attachment Welds Program, element 6, states " An analytical evaluation is performed in accordance with IWB-3600 per procedure ER-AA-330-002."
b. Aging Management Program B.1.3, Reactor Head Closure Studs, element 6, states "Indications and relevant conditions detected during examinations are evaluated in accordance with ASME Section XI Subsection IWB-3100, for Class 1 components in accordance with ER-AA-330-002."
c. Aging Management Program B.1.10, Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel(CASS), element 7, states "Repairs and replacements are performed consistent with the requirements of ASME Section XI Subsections IWA-4000, IWA-7000, IWB-4000, and IWB-7000 as specified in procedures ER-AA-330-002 and ER-AA-330-009."

Assigned To: Fulvio, Al

Response:

The Oyster Creek license renewal process for performing aging management program reviews for consistency with GALL includes a review of the implementing procedures to ensure that the aging management program elements are adequately addressed.
When the implementing procedures are aligned to GALL, they are referenced in the Oyster Creek Basis section of the aging management program 10 element descriptions.
Generally, these implementing procedures provide the technical basis for GALL consistency determinations. If the procedures do not adequately address the GALL element, they are enhanced to ensure consistency, or an exception to GALL is justified. GALL consistency determinations, including any necessary enhancements or exceptions, are also described in the LRA Appendix B program descriptions. This process is described in project level instruction PLI-8.
When the Aging Management Program states that a GALL recommendation is performed in accordance with an industry standard in accordance with a specific implementing procedure, the intent of this is to identify the implementing procedure as a reference, not to imply that the implementing procedure is approved by the NRC during their review of the Aging Management

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Program or that it supercedes the industry standard or that the procedure that is referenced after "in accordance with" changes the statement of fact prior to the word "in accordance with". It is only a reference.

For example in case (b) above, the AMP wil be conducted in accordance with the code. The procedure, ER-AA-330-002, does not take exception to the code. It provides the guidance on how to obtain and evaluate the information to meet the code requirements and is provided as a reference.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Fulvio, Al 10/ 6/2005

Reviewed By: Miller, Mark 10/ 6/2005

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date): 10/ 6/2005

NRC Information Request Form

Item No	***Date Received:***	***Source***
AMP-145		AMP Audit
Topic:	***Status:***	Closed

AMP B.1.14 SSC: Closed Cycle Cooling

Document References:

B.1.14

NRC Representative Villaran, Mike

AmerGen (Took Issue):

Question

The OC LRA states that the Open-Cycle Cooling Water System aging management program is an existing program that is consistent with the elements of aging program XI.M20, Open-Cycle Cooling Water System, specified in NUREG-1801.

In addition to corrosion, NUREG 1801, R1, Sept. 2005, requires measures to minimize and monitor the effects of stress corrosion cracking (SCC). This is a change from the previous (January 05) Draft version of GALL. The OC LRA Basis document does not specifically address how the effects of SCC are minimized / monitored.

Please clarify.

Assigned To: Rafferty-Czincila, Shannon

Response:

Below is the NUREG 1801, R1, Sept. 2005 excerpt from the XI.M20 OPEN-CYCLE COOLING WATER SYSTEM. There is no mention of SCC or any other cracking.

XI.M20 OPEN-CYCLE COOLING WATER SYSTEM
Program Description
The program relies on implementation of the recommendations of the Nuclear Regulatory Commission (NRC) Generic Letter (GL) 89-13 to ensure that the effects of aging on the open-cycle cooling water (OCCW) (or service water) system will be managed for the extended period of operation. The program includes surveillance and control techniques to manage aging effects caused by biofouling, corrosion, erosion, protective coating failures, and silting in the OCCW system or structures and components serviced by the OCCW system.
Evaluation and Technical Basis
1. Scope of Program: The program addresses the aging effects of material loss and fouling due to micro- or macro-organisms and various corrosion mechanisms. Because the characteristics of the service water system may be specific to each facility, the OCCW system is defined as a system or systems that transfer heat from safety-related systems, structures, and components (SSC) to the

ultimate heat sink (UHS). If an intermediate system is used between the safety-related SSCs and the system rejecting heat to the UHS, that intermediate system performs the function of a service water system and is thus included in the scope of recommendations of NRC GL 89-13. The guidelines of NRC GL 89-13 include (a) surveillance and control of biofouling; (b) a test program to verify heat transfer capabilities; (c) routine inspection and a maintenance program to ensure that corrosion, erosion, protective coating failure, silting, and biofouling cannot degrade the performance of safety-related systems serviced by OCCW; (d) a system walk down inspection to ensure compliance with the licensing basis; and (e) a review of maintenance, operating, and training practices and procedures.

2. Preventive Actions: The system components are constructed of appropriate materials and lined or coated to protect the underlying metal surfaces from being exposed to aggressive cooling water environments. Implementation of NRC GL 89-13 includes a condition and performance monitoring program; control or preventive measures, such as chemical treatment, whenever the potential for biological fouling species exists; or flushing of infrequently used systems. Treatment with chemicals mitigates microbiologically influenced corrosion (MIC) and buildup of macroscopic biological fouling species, such as blue mussels, oysters, or clams. Periodic flushing of the system removes accumulations of biofouling agents, corrosion products, and silt.

3. Parameters Monitored/Inspected: Adverse effects on system or component performance are caused by accumulations of biofouling agents, corrosion products, and silt. Cleanliness and material integrity of piping, components, heat exchangers, elastomers, and their internal linings or coatings (when applicable) that are part of the OCCW system or that are cooled by the OCCW system are periodically inspected, monitored, or tested to ensure heat transfer capabilities. The program ensures (a) removal of accumulations of biofouling agents, corrosion products, and silt, and (b) detection of defective protective coatings and corroded OCCW system piping and components that could adversely affect performance of their intended safety functions.

4. Detection of Aging Effects: Inspections for biofouling, damaged coatings, and degraded material condition are conducted. Visual inspections are typically performed; however, nondestructive testing, such as ultrasonic testing, eddy current testing, and heat transfer capability testing, are effective methods to measure surface condition and the extent of wall thinning associated with the service water system piping and components, when determined necessary.

5. Monitoring and Trending: Inspection scope, method (e.g., visual or nondestructive examination [NDE]), and testing frequencies are in accordance with the utility commitments under NRC GL 89-13. Testing and inspections are done annually and during refueling outages. Inspections or nondestructive testing will determine the extent of biofouling, the condition of the surface coating, the magnitude of localized pitting, and the amount of MIC, if applicable. Heat transfer testing results are documented in plant test procedures and are trended and reviewed by the appropriate group.

6. Acceptance Criteria: Biofouling is removed or reduced as part of the surveillance and control process. The program for managing biofouling and aggressive cooling water environments for OCCW systems is preventive. Acceptance criteria are based on effective cleaning of biological fouling organisms and maintenance of protective coatings or linings are emphasized.

7. Corrective Actions: Evaluations are performed for test or inspection results that do not satisfy established acceptance criteria and a problem or condition report is initiated to document the concern in accordance with plant administrative procedures. 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 repetition. 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.
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. As discussed in the appendix to this report, the staff finds the requirements of 10 CFR Part 50, Appendix B, acceptable to address the confirmation process and administrative controls.
9. Administrative Controls: See Item 8, above.
10. Operating Experience: Significant microbiologically-influenced corrosion (NRC Information Notice [IN] 85-30), failure of protective coatings (NRC IN 85-24), and fouling (NRC IN 81-21, IN 86-96) have been observed in a number of heat exchangers. The guidance of NRC GL 89-13 has been implemented for approximately 10 years and has been effective in managing aging effects due to biofouling, corrosion, erosion, protective coating failures, and silting in structures and components serviced by OCCW systems.

Upon further review, it appears that this question might have been directed to the GALL PROGRAM XI.M21 - CLOSED CYCLE COOLING WATER SYSTEMS in which NUREG 1801, R1, Sept. 2005, requires measures to minimize and monitor the effects of stress corrosion cracking (SCC).
RESPONSE:
Oyster Creek controls the risks of Stress Corrosion Cracking (SCC) in the CCCW systems by maintaining Chloride and Fluoride levels each below 10 ppm as recommended in Table A.1 of the EPRI 1007820, "Closed Cooling Water Chemistry Guideline, Revision 1". The Oyster Creek actual limit is < 8ppm with and action level of > 10 ppm for both Fluoride and Chloride. (Reference: CY-AA-120-400) Additionally the EDGCCW, RBCCW and TBCCW heat exchangers are either horizontally mounted, or not applicable (i.e. radiators) to the guidance in EPRI 1007820 Section A.1 which states that "SCC is much more likely in vertical exchangers than in horizontal exchangers. This is due to evaporation and increasing temperatures in the vapor zone, below the top tube sheet. The CCW system heat exchangers under consideration are horizontal and are not prone to this (SCC) failure mode." Section A.1 of EPRI 1007820 further states that the impurity levels of less than 10 ppm are conservative and represent a very low, acceptable risk. (Reference: PBD-AMP-B.1.14)

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 12/20/2006

Reviewed By: Muggleston, Kevin 1/ 4/2006

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-146

Date Received:

Source
AMP Audit

Topic:
AMP B.1.1-11 ASME Section XI ISI IWB, IWC, IWD

Status: Closed

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Cockroft, Joh

Question

Please confirm if the corrective actions element for OCGS AMP B.1.1 is consistent with the guidance provided in BWRVIP-44 and BWRVIP-45 for weld repair of nickel alloys and for weldability of irradiated structural components.

Assigned To: Getz, Stu

Response:

The corrective actions element for OCGS AMP B.1.1 is consistent with the guidance provided in BWRVIP-44 and BWRVIP-45 for weld repair of nickel alloys and for weldability of irradiated structural components.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Getz, Stu 10/ 6/2005

Reviewed By: May, Mike 10/ 6/2005

Approved By: Warfel, Don 10/ 6/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-147

Date Received: 10/ 7/2005

Source AMP Audit

Status: Closed

Topic:
AMP Generic Question

Document References:
All

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

Please provide the basis document of the ten program elements review for the following aging management programs:

B.1.1 ASME Section XI Inservice Inspection, Subsections IWB, IWC and IWD
B.1.2 Water Chemistry
B.1.3 Reactor Head Closure Studs
B.1.4 BWR Vessel ID Attachment Welds
B.1.5 BWR Feedwater Nozzle
B.1.6 BWR Control Rod Drive Return Line Nozzle
B.1.7 BWR Stress Corrosion Cracking
B.1.8 BWR Penetrations
B.1.10 Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS)
B.1.11 Flow-Accelerated Corrosion
B.1.13 Open-Cycle Cooling Water System
B.1.14 Closed-Cycle Cooling Water System
B.1.15 Boraflex Rack Management Program
B.1.16 Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems
B.1.17 Compressed Air Monitoring
B.1.18 BWR Reactor Water Cleanup System
B.1.19 Fire Protection
B.1.20 Fire Water System
B.1.21 Aboveground Outdoor Tanks
B.1.22Fuel Oil Chemistry
B.1.24 One-Time Inspection
B.1.25Selective Leaching of Materials
B.1.26 Buried Piping Inspection
B.1.27 ASME Section XI, Subsection IWE
B.1.28 ASME Section XI, Subsection IWF
B.1.29 10 CFR Part 50, Appendix J
B.1.30 Masonry Wall Program

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B.1.31 Structures Monitoring Program
B.1.32 RG 1.27, Inspection of Water-Control Structures Associated with Nuclear Power Plants
B.1.33 Protective Coating Monitoring and Maintenance Program
B.1.34 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements
B.1.35 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits
B.1.36 Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements
B.3.1 Metal Fatigue of Reactor Coolant Pressure Boundary
B.3.2 Environmental Qualification (EQ) Program

In addition, on 1-24-06, Mr. Donnie Ashley, NRC Project Manager, requested that the following 13 PBDs be provided electronically, since they are also being reviewed by the AMP Audit team:

B.1.12 Bolting Integrity
B.1.12A Bolting Integrity - Forked River Combustion Turbine (FRCT)
B.1.14A Closed Cycle Cooling Water - FRCT
B.1.21A Above-ground Steel Tanks - FRCT
B.1.22A Fuel Oil Chemistry - FRCT
B.1.24A One Time Inspection - FRCT
B.1.25A Selective Leaching - FRCT
B.1.26A Buried Piping Inspection - FRCT
B.1.26B Met Tower Repeater Engine Fuel Supply
B.1.37 Periodic Monitoring of FRCT Power Plant - Electrical
B.2.2 Lube Oil Monitoring Activities
B.2.5 Periodic Inspection Program
B.2.5A Periodic Inspection Program - FRCT

Assigned To: Hufnagel, John

Response:

This request will be responded to in several steps. That is, batches of aging management program basis documents (PBDs) will be provided over a period of time such that when a set of these PBDs is ready for NRC review, that set will be transmitted. This way, the NRC Audit team can continue their reviews while the Oyster Creek team continues to generate the upgraded PBDs. These transmittals are being made an an ongoing activity as part of the AMP Audit.

11/17/05 Update

The initial (two) PBDs provided to the NRC were the Flow Accelerated Corrosion (FAC) and the Reactor Water Cleanup (RWCU) PBDs. These were e-mailed to NRC Project Manager Donnie Ashley, with a copy to Audit Team lead Greg Cranston, on 11/17/05. They were provided in two formats. PDF versions of the documents were provided, which included copies of the signatures of

the preparer, reviewer, program owner (site) and Approver (Project Technical Lead). In addition, as requested by the NRC, Word versions were provided to facilitate the Audit review and report writing process.
- J.G. Hufnagel

11/28/05 Update (J.G. Hufnagel)

Today, 11/28/05, electronic copies (in Word format) of the following approved AMP Basis Documents (PBDs) were provided via e-mail to the NRC Project Manager and NRC AMP/AMR Audit team lead: B.1.02 (Water Chemistry), B.1.22 (Fuel Oil Chemistry), B.1.08 (BWR Penetrations), B.1.19 (Fire Protection), B.1.31 (Structures Monitoring), B.1.01 (ASME Section XI IWB, IWC, IWD), B.1.17 (Compressed Air) and B.1.25 (Selective Leaching). They were sent to NRC in Word format for ease of review and also for ease of docketing the information. Exelon/AmerGen approval signatures on these documents may be reviewed on site (e.g., during the Audits) at the Staff's request.

12/5/05 Update (J.G. Hufnagel)

On Friday, 12/2/05, electronic copies (in Word format) of the following six AMP PBDs were provided to the NRC Project Manager and NRC AMP/AMR Audit team lead: B.1.34 (E-1), B.1.15 (Boraflex), B.1.35 (E-2), B.1.20 (Fire Water System), B.1.24 (One Time Inspections) and B.1.29 (Appendix J). These were six of the nine batch 3 PBDs to be delivered to NRC by 12/5/05.

Today, 12/05/05, electronic copies (in Word format) of the following approved AMP Basis Documents (PBDs) were provided via e-mail to the NRC Project Manager and NRC AMP/AMR Audit team lead: B.1.28 (ASME XI, IWF), B.1.16 (Overhead Cranes), and B.1.21 (Above ground tanks). This completed transmittal of Batch 3 of the AMP PBDs, which were to be transmitted by today. They were sent to NRC in Word format for ease of review and also for ease of docketing the information. Exelon/AmerGen approval signatures on these documents may be reviewed on site (e.g., during the Audits) at the Staff's request.

12/12/05 Update (J.G. Hufnagel)

The following seven AMP PBDs were provided to the NRC via e-mail on December 9, 2005: PBD B.3.01, Metal Fatigue; PBD B.1.36, Electrical (E-3); PBD B.1.13, Open Cycle Cooling Water; PBD B.1.06, BWR CRD return nozzle; PBD B.1.03, Reactor Head Closure Studs; PBD B.1.30, Masonry Walls and PBD B.1.05, Feedwater Nozzles. Delivery of these was confirmed on 12/9 via an e-mail response from Greg Cranston, NRC AMP Audit team Lead.

The following two AMP PBDs were completed and transmitted to NRC Project Manager Donnie Ashley and AMP Audit Team Lead Greg Cranston on 12/12/05: PBD B.1.27, Section XI IWE and PBD B.1.33, Coatings Program. This completes the delivery of Batch 4 of the AMP PBDs, which were to be delivered by 12/12/05.

12/19/05 Update (J.G. Hufnagel)

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The following three AMP PBDs were provided to the NRC via e-mail on December 16, 2005:
PBD B.3.02 EQ, Rev. 0
PBD B.1.10 Cast Austenitic Stainless Steel, Rev. 0
PBD B.1.04 Vessel Attachment welds, Rev 0

NRC receipt of these was verbally confirmed with Project Manager Donnie Ashley.

The following four AMP PBDs were completed and electronically transmitted to NRC Project Manager Donnie Ashley and AMP Audit Team Lead Greg Cranston on 12/19/05:

PBD B.1.14 CCCW, Rev. 0
PBD B.1.32 Water Control Structures, Rev. 0
PBD B.1.26 Buried Piping, Rev. 0
PBD B.1.07 BWR SCC, Rev. 0

This completes delivery, by December 19, 2005, of the upgraded AMP Program Basis Documents that support the ten element reviews for the aging management programs being audited by the NRC during the week of January 23, 2006. The response to this request is now complete. - J.G. Hufnagel, 12/19/05

January 24, 2006 Update

As noted in the question above, on January 24, 2006, Donnie Ashley requested that 13 additional PBDs, that had become part of the scope of the AMP Audit team work, be provided electronically. These thirteen documents have been provided in an e-mail to Donnie Ashley, dated 1-24-06. The documents sent are listed below:

B.1.12 Bolting Integrity
B.1.12A Bolting Integrity - Forked River Combustion Turbine (FRCT)
B.1.14A Closed Cycle Cooling Water - FRCT
B.1.21A Above-ground Steel Tanks - FRCT
B.1.22A Fuel Oil Chemistry - FRCT
B.1.24A One Time Inspection - FRCT
B.1.25A Selective Leaching - FRCT
B.1.26A Buried Piping Inspection - FRCT
B.1.26B Met Tower Repeater Engine Fuel Supply
B.1.37 Periodic Monitoring of FRCT Power Plant - Electrical
B.2.2 Lube Oil Monitoring Activities
B.2.5 Periodic Inspection Program
B.2.5A Periodic Inspection Program - FRCT

LRCR #: *LRA A.5 Commitment #:*

IR#:

NRC Information Request Form

Approvals:

Prepared By:	Hufnagel, John	1/24/2006
Reviewed By:	Miller, Mark	1/24/2006
Approved By:	Warfel, Don	1/24/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-148

Date Received: 10/20/2005

Source AMP Audit

Status: Closed

Topic:
Aboveground Outdoor Tanks

Document References:
B.1.21

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

In Element 5. Monitoring and Trending, GALL states "The effects of corrosion of the aboveground external surface are detectable by visual techniques. Based on operating experience, plant system walkdowns during each outage provide for timely detection of aging effects. The effects of corrosion of the underground external surface are detectable by thickness measurement of the tank bottom and are monitored and trended if significant material loss is detected."

Question: What is the schedule of plant system walkdowns by OCGS and is the OCGS schedule consistent with the GALL recommendation?

Assigned To: Micklo, Charles

Response:

The new Oyster Creek Aboveground Outdoor Tank aging management inspection program is based on industry and site specific operating experience and guidance for criteria and frequency. The program utilizes structured inspections designed to applicable aging effects in place of system walkdowns each outage. The initial frequency will be inspections every five years. This is recognized as an exception to NUREG-1801. This is a new exception not previously identified in the LRA.

The following discussion is extracted from PBD-AMP-B.1.21 section 3.5 and is an exception to NUREG-1801, element 5.

" The aboveground tanks external surfaces will be visually inspected for coating degradation and corrosion on uncoated aluminum by inspections at least once every five years. The new Oyster Creek Aboveground Outdoor Tanks aging management program will incorporate tank inspections in place of system walkdowns. Inspection frequency is determined based on industry recommendations and specific tank service. (Reference: 4.3.1) This is consistent with the practical life of external coatings (Reference: 4.2.2, Section 5.2.6) and the industry application of structures monitoring programs in response to the Maintenance Rule (Reference: 4.2.5). Refer to Exceptions to NUREG-1801, Element 5 discussion below for additional technical basis.

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The effects of corrosion of the Diesel Generator Fuel Oil Tank bottom external surface (mounted on concrete) and the condensate storage and the Fire Protection Water Storage Tanks bottom external surfaces (exposed to soil) are detectable by thickness measurement of the tank bottom. Initial thickness measurements will be compared to design requirements. The results of these inspections are monitored and trended if significant material loss is detected such that component intended function is ensured.

Exceptions to NUREG-1801, Element 5:
The program takes exception to the inspection frequency during each outage specified in NUREG-1801 Rev. 1 XI.M29, Aboveground Steel Tanks, for monitoring external surfaces of tank surfaces. The specified frequency by the Oyster Creek program is every 5 years. Technical basis for this exception is as follows.

· The frequency of 5 years specified for monitoring of exterior surfaces of tanks is consistent with the frequency specified for exterior surfaces of supporting structures. The 5 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 tank before an intended function is impacted.

· Tank components subject to outdoor air are constructed from stainless steel or 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 5 years provides reasonable assurance that loss of material will be detected before an intended function is affected.

· Studies by EPRI (Reference: 4.2.6, 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 year. If the corrosion rate is conservatively taken as 0.926 mils per year, then the loss of material projected for 5 years is less than 5 mils. This loss of material is insignificant and will not impact the intended function of mechanical components (References: 4.2.6, 4.2.7).

Comparison and Evaluation Conclusion:
This element is consistent with exceptions with NUREG-1801 Rev. 1 XI.M29, Aboveground Steel Tanks, for monitoring external surfaces of tanks. The specified frequency by the Oyster Creek program is every 5 years; while XI.M29 requires a frequency of each outage. Technical basis for this exception is that, based on plant specific operating experience and industry experience, the 5-year frequency is adequate to provide reasonable assurance that aging effects will be detected and corrected before a loss of an intended function. "

References are included in PBD-AMP-B.1.21 notebook.

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LRCR #: 231 ***LRA A.5 Commitment #:***

IR#: 376714.04.05

Approvals:

Prepared By:	Micklo, Charles	12/20/2005
Reviewed By:	Rafferty-Czincila, Shannon	12/20/2005
Approved By:	Warfel, Don	1/ 4/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-149

Date Received: 10/20/2005

Source AMP Audit

Status: Closed

Topic:
Boraflex Rack Management Program

Document References:
B.1.15

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

In the Program Description, GALL states "... (2) Completing sampling and analysis for silica levels in the spent fuel pool water and trending the results by using the EPRI RACKLIFE predictive code or its equivalent on a monthly, quarterly, or annual basis (depending on Boraflex panel condition). ..."

However, the Applicant stated in it's Program description that "Sampling of silica in the spent fuel pool is on a weekly basis and its trending using RACKLIFE is on a frequency of two years or less."

Question/Issue: The frequency of trending using RACKLIFE by applicant is less frequent than the GALL recommendation. If RACKLIFE trending is not done on at least an annual basis, this should be identified as an exception to GALL and the basis provided.

Assigned To: Ouaou, Ahmed

Response:

The Oyster Creek Boraflex Rack Management Program requires sampling of pool silica on a weekly basis. The silica data is forward to EPRI for trending on quarterly basis consistent with the current industry practice. The Boraflex Rack Management Program implementing documents require updating RACKLIFE computer model as follows, a) following each refueling outage to keep the model and data files up to date, 2) preceding a refueling outage to avoid placing freshly discharged fuel in the most degraded rack locations, 3) following other fuel moves (e.g. pool shuffles). Consequently RACKLIFE computer model is updated more frequently than 2 years. More importantly it is updated before and after events that may cause a change to the model.

As noted by the Staff, GALL XI.M22 Program description states that "..Completing sampling and analysis for silica levels in the spent fuel pool water and trending the results by using the EPRI RACKLIFE predictive code or its equivalent on a monthly, quarterly, or annual basis (depending on Boraflex panel condition).." We did not take exception to these frequencies because of the following,
1. These frequencies are only discussed in program description. They are not identified as a requirement in any of the 10-Elements of the program.
2. It is not clear if these frequencies apply to sampling of silica or updating RACKLIFE. It is

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reasonable to require sampling of silica on a monthly basis; but unreasonable to require updating RACKLIFE at such a frequency. We assumed the frequency is applied to silica sampling, analysis and trending.

3. Trending using the RACKLIFE model is used only to predict the condition of Boraflex and is not relied upon to manage aging of Boraflex. The BADGER in-situ test is relied upon for aging management of Boraflex.

4. Operating experience, considering Oyster Creek Boraflex condition, shows that updating the RACKLIFE computer model as specified by the program implementing procedures is adequate to assess and predict the condition of Boraflex and support BADGER testing.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 12/21/2006

Reviewed By: Getz, Stu 1/ 5/2006

Approved By: Warfel, Don 1/ 5/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-154

Date Received: 10/31/2005

Source AMP Audit

Status: Closed

Topic:
Electrical Cables & Connections not Subject to 10CFR50.49 En

Document References:
B.1.34

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

OCGS AMP B.1.34 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements (GALL AMP XI.E1)

For Program Element 10, the applicant states that "several instances of degradation of cables in adverse localized environments have been identified during the conduct of routine maintenance activities and dispositioned using the corrective action process. In each case, engineering evaluations determined the cause of the apparent degradation, the effect on operability and appropriate corrective action." Provide a summary of the causes and the evaluation of the corrective actions regarding these instances.

Assigned To: Spamer, Deb

Response:

Program Basis Document PBD-AMP-B.1.34 has been issued providing a comparison of the credited Oyster Creek program with the elements of the corresponding NUREG 1801 Chapter XI program XI.E1, Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements. Section 3.10 provides a comparison to the Operating Experience discussed in NUREG 1801, Chapter XI, program XI.E1 and Oyster Creek operating experience. The following is an excerpt of the Oyster Creek operating experience with respect to causes and the evaluation of corrective actions regarding these instances.

Several instances of degradation of cables in adverse localized environments have been identified at Oyster Creek during the conduct of routine maintenance activities.

a. CAP O2001-0483 evaluated cable routed in conduits that were either touching or in close proximity to the Iso Condenser Vent (hot process) Pipe, located in the area of the Control Rod Drive Hydraulic Control Units in the Reactor Building. It was noted that this pipe was only partially insulated, probably removed to accommodate fire protection piping and that the observed configuration was most likely original design (proximate causes). The evaluation determined that the cable was designed for this environment (i.e., the cable service limiting design criteria were not

exceeded in the localized environment of the hot pipe) and the cable's associated component, per satisfactory quarterly testing, was operable. An existing specification, SP-9000-41-005, effective since 1986, for cable and raceway system installations would preclude future installations that might jeopardize cable insulation integrity. A work request was completed to re insulate the vent pipe.

b. CAPs O1998-0734 and O2000-1604 evaluated condenser conductivity monitor cables routed and terminated in the turbine building basement electrical panel. Proximate cause of cable embrittlment is environmental conditions. The CAPs determined that failures of these circuits and their associated components were non consequential in that the 1998 identified cables would be repaired if and as they failed and the 2000 identified cables would be abandoned in place if and as they failed.

c. CAP O2002-0813 evaluated a diesel generator control circuit cable with cracked insulation. It was determined that the minor nature of insulation cracking and physically arrangement of adjacent wires precluded this issue from causing a diesel generator operability concern. Proximate cause of the insulation cracking was environmental conditions. The wire was wrapped with electrical tape and scheduled for replacement during future scheduled inspection.

d. CAPs O2000-0609 and O2004-2153 evaluated leaking/dripping cable insulations. The 2000 identified issue involved PVC cable, was evaluated by a laboratory, and determined to be the result of a phenomenon called "bleeding." The cables were demonstrated to be operationally sound and it was recommendations that the installation be monitored. A similar occurrence is evaluated in the 2004 CAP.

The evaluations and subsequent actions associated with these CAPs provide objective evidence that Oyster Creek's operating experience does not show an adverse trend with respect to cable insulation performance. Although the causes generally align with this aging management program's aging effect, the problems encountered and evaluated would not cause significant impact to the safe operation of the plant. Adequate corrective actions were taken to address the identified concerns.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 12/20/2005

Reviewed By: Muggleston, Kevin 12/20/2005

Approved By: Warfel, Don 12/21/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-155

Date Received: 10/31/2005

Source AMP Audit

Topic:
Electrical Cables & Connections Not Subject to 10 CFR50.49 E

Status: Closed

Document References:
B.1.35

NRC Representative Mathew, Roy

AmerGen (Took Issue): Warfel, Don

Question

OCGS AMP B.1.35 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits (GALL AMP XI.E2)

Provide clarification whether cables used in high voltage, low level signal application that are sensitive to reduction in insulation resistence are in scope of this program.

Assigned To: Spamer, Deb

Response:

Program Basis Document PBD-AMP-B.1.35 has been issued providing a comparison of the credited Oyster Creek program with the elements of the corresponding NUREG 1801 Chapter XI program XI.E2, Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits. By definition, the scope of this program includes the Oyster Creek circuits with sensitive, high voltage, low level signals that are within the scope of license renewal. Other systems' circuits may have been excluded from the scope of this program because they did not fuflfill a license renewal intended function or because the system and its cables are included in Oyster Creek's environmental Qualification Program. The scoping process and results are documented in Section 2 of the License Renewal Application. The resulting systems included in the scope of this Oyster Creek Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits aging management program are: Intermediate Range Power Monitoring (IRM), Local Power Range Monitoring/Average Power Range Monitoring (LPRM/APRM), Reactor Building High Radiation Monitoring, and Air Ejector Offgas Radiation Monitoring.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 12/21/2005

NRC Information Request Form

Reviewed By: Muggleston, Kevin 12/21/2005

Approved By: Warfel, Don 12/21/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-156		10/31/2005	AMP Audit
Topic:		***Status:***	Closed

Electrical Cables & Connections Not Subject to 10 CFR50.49 E

Document References:

B.1.35

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

<u>Question</u>

OCGS AMP B.1.35 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits (GALL AMP XI.E2)

Provide clarification whether the cables and connections within the scope of this program that are used in sensitive instrumentation circuits are high voltage.

Assigned To: Spamer, Deb

<u>Response:</u>

Program Basis Document PBD-AMP-B.1.35 has been issued providing a comparison of the credited Oyster Creek program with the elements of the corresponding NUREG 1801 Chapter XI program XI.E2, Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits. The PBD clarifies in the Program Description (Section 2.1) and again in the Scope of Program (Section 3.1 for Element 1) that the sensitive instrumentation circuits in the scope of this program are high voltage circuits.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By:	Spamer, Deb	12/21/2005
Reviewed By:	Muggleston, Kevin	12/21/2005
Approved By:	Warfel, Don	12/ 2/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No	*Date Received:*	*Source*
AMP-157	10/31/2005	AMP Audit
Topic:	*Status:*	Closed

Electrical Cables & Connections Not Subject to 10 CFR50.49 E

Document References:

B.1.35

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

OCGS AMP B.1.35 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits (GALL AMP XI.E2)

Provide a summary of review/evaluation regarding operating experience for this program.

Assigned To: Spamer, Deb

Response:

Program Basis Document PBD-AMP-B.1.35 has been issued providing a comparison of the credited Oyster Creek program with the elements of the corresponding NUREG 1801 Chapter XI program XI.E2, Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits. Section 3.10 provides a comparison to the Operating Experience discussed in NUREG 1801, Chapter XI, program XI.E2 and Oyster Creek operating experience. The following is the Oyster Creek operating experience review/evaluation.

3.10 Operating Experience

NUREG-1801:

Operating experience has identified a case where a change in temperature across a high range radiation monitor cable in containment resulted in substantial change in the reading of the monitor. Changes in instrument calibration can be caused by degradation of the circuit cable and are a possible indication of electrical cable degradation.

The vast majority of site specific and industry wide operating experience regarding neutron flux instrumentation circuits is related to cable/connector issues inside of containment near the reactor vessel.

Oyster Creek:

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In a review of industry operating experience, as noted in NUREG-1801, adverse localized environments have been shown to produce degradation of radiation monitoring system cables and connectors. Oyster Creek has experienced degradation of radiation monitoring system cables and connectors that were identified during the conduct of routine calibration and cable testing. However, the Oyster Creek operating experience review results do not display an adverse trend with respect to cable and connection insulation performance in sensitive, high voltage, low-level instrumentation circuits.

Operating experience, both internal and external, is used in two ways at Oyster Creek to enhance plant programs, prevent repeat events, and prevent events that have occurred at other plants from occurring at Oyster Creek. The first way in which operating experience is used is through the Oyster Creek Operating Experience process. The Operating Experience process screens, evaluates, and acts on operating experience documents and information to prevent or mitigate the consequences of similar events. The second way is through the process for managing programs. This process requires the review of program related operating experience by the program owner.

Both of these processes review operating experience from both external and internal (also referred to as in house) sources. External operating experience may include such things as INPO documents (e.g., SOERs, SERs, SENs, etc.), NRC documents (e.g., GLs, LERs, INs, etc.), General Electric documents (e.g., RCSILs, SILs, TILs, etc.), and other documents (e.g., 10CFR Part 21 Reports, NERs, etc.). Internal operating experience may include such things as event investigations, trending reports, and lessons learned from in house events as captured in program notebooks, self assessments, and in the 10 CFR Part 50, Appendix B corrective action process.

Demonstration that the effects of aging are effectively managed is achieved through objective evidence that shows that in instrumentation circuits with sensitive, high voltage, low-level signals, cable and connector insulation degradation due to adverse environmental conditions is being adequately managed. The following examples of operating experience provide objective evidence that the Electrical Cable and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits aging management program, that includes an enhancement to trend and review test results prior to the period of extended operation and every 10-years thereafter, is effective in assuring that intended function(s) will be maintained consistent with the CLB for the period of extended operation.

1. A few instances of degradation of cable insulation in adverse localized environments have been identified at Oyster Creek during the conduct of routine maintenance, calibration and testing activities. Just as importantly, some of the CAPs for these systems and components identify other causes for system and component issues, not related to age degradation of the insulation in these detector/monitor circuits.

a) CAPs O2003-1308 and O2004-1644 evaluated issues with the "A" and "B" Air Ejector Offgas Radiation Monitoring channels, respectively. In the 2003 CAP, there was a slow and steady downward trend of the "A" channel output. In the 2004 CAP there was a 29% step change in the "B" channel output. Both occurrences were observed by operations. In both instances, cables were determined to be degraded by comparison of cable test results of the degraded cables and other

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properly functioning instrumentation channel. It is believed that the proximate cause is cable insulation degradation due to exposure to adverse environments. In both cases, normal outputs were restored by replacement of detector cables. The radiation monitoring channel was determined to be operable providing objective evidence that insulation degradation will be detected prior to loss of intended function, and adequate corrective actions are taken to prevent recurrence.

b) CAP O2002-1937 evaluates a spike on LPRM 28-33C. It was determined based on follow-up IV cable testing, that the spike was most likely caused by detector "whiskers," which are not related to insulation degradation. It should be noted that this CAP documents General Electric's, the vendor for this system, recommendation to use IV testing for burn off of "whiskers" and restoration of channel monitoring functions, further supporting the use IV testing as part of the condition monitoring of this aging management program.

c) CAP O1999-0235 evaluates two LPRMs that failed upscale resulting in an APRM going "high" and a subsequent half scram. A definitive root cause was not identified in the CAP, although General Electric did not believe that the upscale failures were a result of cable issues.

2. CAP O2003-1097 was initiated to determine if there was an adverse trend in the performance of IRMs (and SRMs) during Oyster Creek plant shutdowns, outage periods and startups. CAPs dealing with IRM (and SRM) issues since 1998 were reviewed and binned by causes, including spiking, which is the primary symptom of insulation degradation. The data did not indicate that spiking had become a more prevalent issue as the system aged. Following assertive engineering principles, corrective actions to address spiking causes were implemented. None of these seven actions addressed cable and connection insulation degradation since it had not been determined to be a recurring cause. Subsequently, CAP O2004-1314 was initiated to evaluate a subsequent failure of IRM channels 13, 14, and 18. Under vessel cable connections were identified, via the Char testing implementing this program, as a potential weak link with respect to loop susceptibility to noise (see corrective action 12). Monitoring/testing of circuits is continuing. Other causes to noise susceptibility were identified with associated corrective actions.

3. Industry operating experience has demonstrated that adverse localized environments can degrade the insulation of cables and connectors used in sensitive, high voltage, low signal instrumentation circuits, potentially impacting electrical continuity and associated signal accuracies. As supported by NUREG-1801, radiation monitoring systems have industry operating experience documenting failure of these components to provide accurate indication/monitoring due to cable and connector insulation degradation. The SAND96-0344 report provides additional industry operating experience and analysis for these instrumentation circuits.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 12/20/2005

NRC Information Request Form

Reviewed By: Muggleston, Kevin 12/20/2005

Approved By: Warfel, Don 12/21/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-158

Date Received: 10/31/2005

Source AMP Audit

Topic:
Electrical Cables & Connections Not Subject to 10 CFR50.49 E

Status: Closed

Document References:
B.1.35

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

OCGS AMP B.1.35 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits (GALL AMP XI.E2)

In the Program Description for this program, the applicant states that, "Containment high range radiation is not included because it is governed by the EQ program." Please provide clarification whether the entire containment high range radiation monitoring subsystem is covered by the EQ program.

Assigned To: Spamer, Deb

Response:

Containment High Range Radiation Monitors are part of the license renewal Post Accident Monitoring System. Post Accident Monitoring is an electrical monitoring system whose purpose is to display and record plant parameters of Drywell radiation and pressure levels; Torus level and temperature; and Safety/Relief Valve flow detection during and following a Loss Of Coolant Accident. Two high range radiation monitors are installed within the drywell, with readouts in the Control Room. These monitors provide the capability to monitor radiation levels in the drywell and the signal from these monitors isolate the drywell ventilation on a high radiation reading.

The two high range radiation monitors have Component Record List identification numbers of RE-790 and RE-791, Containment High-Range Detector, Channels 1 and 2. The component records were reviewed and it was verified that these safety related components associated with Reg Guide 1.97 are classified as part of the Environmental Qualification Program. The qualification of these monitors is documented in Oyster Creek EQ package OC-373. The Oyster Creek Environmental Qualification Program, by definition, would include the electrical equipment, including cables and connections, associated with these monitors and located in EQ harsh environments.

LRCR #:

LRA A.5 Commitment #:

IR#:

NRC Information Request Form

Approvals:

Prepared By:	Spamer, Deb	12/20/2005
Reviewed By:	Muggleston, Kevin	12/20/2005
Approved By:	Warfel, Don	12/21/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No		*Date Received:*	*Source*
AMP-159		10/31/2005	AMP Audit
Topic:		*Status:*	Closed

Electrical Cables & Connections Not Subject to 10 CFR50.49 E

Document References:
B.1.35

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

OCGS AMP B.1.35 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits (GALL AMP XI.E2)

GALL AMP XI.E2 specifically recommends that an engineering evaluation is performed when test acceptance criteria are not met. Provide clarification whether an engineering evaluation is performed under the Corrective Action Program as stated in the Oyster Creek Basis for Program Element 7.

Assigned To: Spamer, Deb

Response:

An issue report under the Corrective Action Program will be written and corrective action taken for the IRM and LPRM/APRM cables that fail to meet the acceptance criteria of the cable tests. For Air Ejector Offgas Radiation Monitoring and Reactor Building High Radiation Monitoring, corrective actions such as recalibration and circuit trouble-shooting are implemented when calibration results do not meet the acceptance criteria. When the instrument loop cannot be recalibrated to meet the technical specifications surveillance calibration acceptance requirements, an issue report will be written and corrective action taken. Issue reports are the initiating step in Oyster Creek's corrective action process.

The Oyster Creek corrective action process considers significance of the surveillance/test results, operability of the associated components and systems, reportability, extent of condition, root causes and likelihood of recurrence. An engineering evaluation is performed for the identified condition to ensure that the intended functions of the associated electrical cable system can be maintained consistent with the current licensing basis.

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

LRCR #: *LRA A.5 Commitment #:*

NRC Information Request Form

IR#:

Approvals:

Prepared By:	Spamer, Deb	12/20/2005
Reviewed By:	Muggleston, Kevin	12/20/2005
Approved By:	Warfel, Don	12/21/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-160

Date Received: 10/31/2005

Source AMP Audit

Topic:
Electrical Cables & Connections Not Subject to 10 CFR50.49 E

Status: Closed

Document References:
B.1.35

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

OCGS AMP B.1.35 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits (GALL AMP XI.E2)

Oyster Creek LRA Page B-94 identified two enhancements for this aging management program. However, there is no mention of these enhancements in the basis document. The applicant is requested to provide the bases and the program elements to which these enhancements are associated with for this aging management program.

Assigned To: Spamer, Deb

Response:

Program Basis Document PBD-AMP-B.1.35 has been issued providing a comparison of the credited Oyster Creek program with the elements of the corresponding NUREG 1801 Chapter XI program XI.E2, Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits. Per NUREG-1801, Chapter XI, program XI.E2, Element 5,

"Trending actions are not included as part of this program because the ability to trend test results is dependent on the specific type of test chosen. However, test results that are trendable provide additional information on the rate of degradation."

It was decided that the existing Oyster Creek program would be enhanced to include trending of (1) calibration test results and (2) cable test results. The existing program is being enhanced to include the following:

1. Calibration results are currently not trended and reviewed. This existing program will be enhanced such that the calibration test results for the Reactor Building High Radiation Monitoring and Air Ejector Offgas Radiation Monitoring systems will be trended and reviewed. This review will be performed prior to the period of extended operation and every 10 years thereafter.

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2. Cable test results are currently not trended and reviewed. This existing program will be enhanced such that the cable test results for the IRM and LPRM/APRM systems will be trended and reviewed. This review will be performed prior to the period of extended operation and every 10 years thereafter.

These enhancements are also linked to Element 3, Parameters Monitored and Inspected and Element 4, Detection of Aging Effects, since the enhancements for trending of calibration and cable test results will aid in assuring implementation of these program elements.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 12/20/2005

Reviewed By: Muggleston, Kevin 12/20/2005

Approved By: Warfel, Don 12/21/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No	*Date Received:*	*Source*
AMP-161	10/31/2005	AMP Audit
	Status:	Closed

Topic:
Electrical Cables & Connections Not Subject to 10 CFR50.49 E

Document References:
B.1.35

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

OCGS AMP B.1.35 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits (GALL AMP XI.E2)

Provide clarification whether OCGS AMP B.1.35 is a new or an existing program?

Assigned To: Spamer, Deb

Response:

Oyster Creek's Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits aging management program that is credited for managing cable and connection age related insulation degradation, due to adverse environmental conditions is an existing program. The existing tests, which are implemented by controlled station procedures, are:

1. For the IRM system, the cables from the detectors to the control room panels are subject to Current/Voltage (I/V) and Time Domain Reflectometry (TDR) testing. The IRM cable testing is performed by procedures 2400-SMI-3623.03, IRM, SRM, LPRM Characterization Trending and Diagnostics (TDR testing), and 2400-SMI-3623.08, IRM Detector Current-Voltage (I.V.) Testing.

2. For the LPRM/APRM system, the cables from the detectors to the control room panels are subject to Current/Voltage (I/V) and Time Domain Reflectometry (TDR) testing. The LPRM/APRM cable testing is performed by procedures 2400-SMI-3623.03, IRM, SRM, LPRM Characterization Trending and Diagnostics (TDR testing), and 2400-SMI-3623.09, Calibration and Operation of the LPRM Diagnostic (I.V. testing).

3. Calibration surveillance testing is credited for the Reactor Building High Radiation Monitoring system condition monitoring of cable and connection insulation integrity. The Reactor Building High Radiation Monitoring calibration testing is performed by procedure 621.3.005, High Radiation Monitor – Reactor Building Isolation - Calibration.

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4. Calibration surveillance testing is credited for Air Ejector Offgas Radiation Monitoring system condition monitoring of cable and connection insulation integrity. The Air Ejector Offgas Radiation Monitoring calibration testing is performed by procedure 621.3.002, Air Ejector Off Gas Radiation Monitor Check Source Functional Test.

The Oyster Creek Electrical Cables and Connections Not Subject to 10 CR 50.49 Environmental Qualification Requirement Used in Instrumentation Circuits aging management program will be enhanced to include the following:

- Calibration results are currently not trended and reviewed. This existing program will be enhanced such that the calibration test results for the Reactor Building High Radiation Monitoring and Air Ejector Offgas Radiation Monitoring systems will be trended and reviewed. This review will be performed prior to the period of extended operation and every 10 years thereafter.

- Cable test results are currently not trended and reviewed. This existing program will be enhanced such that the cable test results for the IRM and LPRM/APRM systems will be trended and reviewed. This review will be performed prior to the period of extended operation and every 10 years thereafter.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 12/20/2005

Reviewed By: Muggleston, Kevin 12/20/2005

Approved By: Warfel, Don 12/21/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-186

Date Received: 1/24/2006

Source AMP Audit

Topic:
GALL Reconciliation

Status: Closed

Document References:

NRC Representative Donnie Ashley

AmerGen (Took Issue): Hufnagel, Joh

Question

Please provide an electronic copy of the document prepared by Exelon/AmerGen to reconcile the LRA with respect to the changes introduced by the September 2005 GALL revision.

Assigned To: Hufnagel, John

Response:

An electronic copy (PDF format) of the "Reconciliation Document" prepared by Exelon/AmerGen and discussed with the NRC Audit team during 1/23/06 the Audit week was e-mailed to Mr. Donnie Ashley on 1/30/06 by George Beck, per Mr. Ashley's request. This item is complete. - J. G. Hufnagel

Closure note - On 2-15-06, it was confirmed with Mr. Ashley that this item has been completed and this tracking item (AMP-186) is closed. - J.G. Hufnagel

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Hufnagel, John 2/ 7/2006

Reviewed By: N/A

Approved By: Warfel, Don 2/ 7/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-187

Date Received: 1/24/2006

Source
AMP Audit

Topic:
Coatings

Status: Closed

Document References:
B.1.33

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

Please discuss OCGS use of Level III coatings and identify whether any Service Level III coatings are credited for corrosion protection for license renewal.

Assigned To: Miller, Mark

Response:

Exelon Corporate Procedure ER-AA-330-008 in paragraph 2.7.3 defines Service Level III coatings as coatings used on any exposed surface area located outside containment whose failure could adversely affect normal plant operation or orderly and safe plant shutdown. Service Level III coatings are also used in areas outside the reactor containment where failure could adversely affect the safety function of a safety-related structure, system, or component. Oyster Creek Specification SP-9000-06-004 in paragraph 3.2.1.c) specifies the use of Service Level III coatings on structures/components subjected to corrosive environment (e.g., liquid immersion, saltwater contact, underground burial, outdoor exposure, etc.).

For license renewal, Service Level III coatings are only credited for corrosion protection for the external surfaces of piping and fittings exposed to a soil (external) environment in the Emergency Service Water System, Service Water System, and Roof Drain and Overboard Discharge System. These coatings are managed under the Buried Piping Inspection aging management program, B.1.26. Other than the Service Level I and II coatings discussed in PBD-AMP-B.1.33, and the Service Level III coatings described in response to this question, no other protective coatings are credited for corrosion protection for license renewal.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 1/25/2006

NRC Information Request Form

Reviewed By: Rafferty-Czincila, Shannon 1/25/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		*Date Received:*	*Source*
AMP-188		1/24/2006	AMP Audit
Topic:		*Status:*	Accepted by NRC
Coatings			

Document References:
B.1.33

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

P. 7 of the PBD states in the Summary of Enhancements to NUREG-1801: The inspection of Service Level I and Service Level II protective coatings that are credited for mitigating corrosion on interior surfaces of the Torus shell and vent system, and, on exterior surfaces of the Drywell shell in the area of the sandbed region, will be consistent with ASME Section XI, Subsection IWE requirements.

Please clarify exactly what this enhancement entails. What changes are necessary to make the coating program consistent with ASME Section XI, Subsection IWE requirements

Assigned To: Miller, Mark

Response:

The requirements for coating inspections are included in the following Oyster Creek specifications:
1. The inspection requirements for Service Level I protective coatings that are credited for mitigating corrosion on interior surfaces of the Torus shell and vent system are included in SP-1302-52-120, "Specification for Inspection and Localized Repair of the Torus and Vent System Coating"
2. The inspection requirements for Service Level II protective coatings that are credited for mitigating corrosion on exterior surfaces of the Drywell shell in the area of the sandbed region are included in IS-328227-004, "Functional Requirements for Drywell Containment Vessel Thickness Examination"

These specifications do not currently invoke all of the requirements of ASME Section XI, Subsection IWE. The following requirements will be included in these inspection specifications:
1. Torus and vent system internal coating inspections will be per Examination Category E-A and will require VT-3 visual examinations per IWE-3510.2.
   a. The inspected area shall be examined (as a minimum) for evidence of flaking, blistering, peeling, discoloration, and other signs of distress.
   b. Areas that are suspect shall be dispositioned by engineering evaluation or corrected by repair or replacement in accordance with IWE-3122.
   c. Supplemental examinations in accordance with IWE-3200 shall be performed when specified as a result of engineering evaluation.

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2. Sandbed Region external coating inspections will be per Examination Category E-C (augmented examination) and will require VT-1 visual examinations per IWE-3412.1.

a. The inspected area shall be examined (as a minimum) for evidence of flaking, blistering, peeling, discoloration, and other signs of distress.

b. Areas that are suspect shall be dispositioned by engineering evaluation or corrected by repair or replacement in accordance with IWE-3122.

c. Supplemental examinations in accordance with IWE-3200 shall be performed when specified as a result of engineering evaluation.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: Miller, Mark 1/25/2006

Reviewed By: Getz, Stu 1/26/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-189

Date Received: 1/24/2006

Source AMP Audit

Status: Closed

Topic:
Generic

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

The Program Basis Documents for several of the OCGS AMPs include new commitments that are not documented in the OCGS LRA. Please clarify how these new commitments will be documented and incorporated into the LRA.

Assigned To: Hufnagel, John

Response:

New commitments or changes to the information contained in the LRA are captured in the License Renewal Change Request (LRCR) process and/or the Exelon/AmerGen Commitment Management process as appropriate. Any changes that materially affect the LRA or result in new commitments will be included in supplemental letter(s) submitted from AmerGen to NRC under oath which will thereby incorporate those changes into the LRA. These processes will also ensure that commitments made in the Aging Management Program Basis Documents are captured in program implementation documents (e.g., procedures).

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Hufnagel, John 2/ 9/2006

Reviewed By: Muggleston, Kevin 2/ 9/2006

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-190

Date Received: 1/24/2006

Source AMP Audit

Topic:
ASME Section XI Subsection IWB IWC IWD

Status: Closed

Document References:
B.1.1

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

(Audit2 B.1.1-12): The discussion of enhancements for OCGS AMP B.1.1 in the LRA states that monitoring activities for the isolation condenser that are recommended in NUREG-1801 will be added to the existing OCGS program. The Program Basis Document for OCGS AMP B.1.1 (PBD-AMP-B.1.01) identifies the enhancement in Section 2.4, Summary of Enhancements to NUREG-1801; however, it does not identify the program elements to which It applies. Please identify the program elements to which this the stated enhancement applies.

Assigned To: Getz, Stu

Response:

The enhancement to OCGS AMP B.1.1 consisting of activities to monitor temperature and radioactivity of the isolation condenser shell side water, eddy current testing of the tubes, and inspections (VT or UT) of the channel head and tube sheets, with verification of effectiveness of the program through monitoring and trending of results, is listed in the PBD document under section 2.0, Program Description. This is in response to the statement in the NUREG-1801 program XI.M1 Program Description section which says that in certain cases, the ASME inservice inspection program is to be augmented to manage effects of aging for license renewal and is so identified in the GALL report. The GALL specification for the augmented isolation condenser inspection activities is contained in GALL line item R-15 in September 2005 Revision 1 NUREG-1801.

The PBD document will be revised to also list this enhancement in Element 1, Scope of Program, Element 3, Parameters Monitored or Inspected, and Element 5, Monitoring and Trending.

LRCR #: 254 *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Getz, Stu 1/25/2006

NRC Information Request Form

Reviewed By:	Corsi, Lou	1/26/2006
Approved By:	Polaski, Fred	1/26/2006
NRC Acceptance (Date):	1/26/2006	

NRC Information Request Form

Item No
AMP-191

Date Received: 1/24/2006

Source AMP Audit

Status: Closed

Topic:
Fuel Oil Chemistry

Document References:
B.1.22

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

Audit2-B.1.22-10): The discussion of operating experience in Section 3.10 of the program basis document for AMP B.1.22 (PBD-AMP-B.1.22) states that Oyster Creek experienced an increasing trend in the concentration of water and sediment in EDG fuel oil tank bottom and multilevel samples. Corrective actions involved using a feed and bleed process to replace the oil in the EDG fuel oil tank. Please provide the following information related to this event:
a) What was the root cause of the increasing trend in the concentration of water and sediment in the EDG fuel oil tank samples?
b) What were the levels of water and sediment in the oil and how long did the problem persist?
c) Explain the feed and bleed process and how this corrects the root cause of the problem noted.

Assigned To: Miller, Mark

Response:

The event(s) involving the increasing trend in water and sediment in Emergency Diesel Generator (EDG) Fuel Storage Tank bottom and multilevel samples are documented and evaluated in CAP (Corrective Action Process) No. O2003-2076. CAP No. O2003-2076 is included in the Plant Operating Experience tab of the Fuel Oil Chemistry Program Basis Document B.1.22.

a) The increased trend in water and sediment was attributed to long-term accumulation. Prior to this event, Oyster Creek did not have in place recurring tasks to periodically drain water and sediment from the bottom of fuel oil storage tanks. Current Oyster Creek practices include quarterly periodic recurring tasks to drain accumulated water and sediment from the bottoms of the EDG Fuel Storage Tank, Fire Pond Diesel Fuel tanks, and the Main Fuel Oil Tank.

b) An increase was noted in the monthly emergency diesel storage tank bottoms sample from 10/8/03 at 16:15, as water and sediment increased from <0.05% to 0.05%. A second bottoms sample was obtained on 10/9/03 at 11:05 that confirmed the prior results of 0.05%. A weekly emergency diesel storage tank sample from 10/5/03 also indicated an increase from <0.05% to 0.05%. A second sample was obtained on 10/6/03, which confirmed the 0.05% result from 10/5/03. Further sampling was performed on 10/9/03, which produced a result of <0.05%. All sample results from the

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emergency diesel storage tank and bottoms were within the specification, which is < or equal to 0.05 % water and sediment.

c) On 10/9/03 the plant obtained the use of a vacuum truck and a tanker truck. The vacuum truck pulled approximately 400 gallons of EDG Fuel Oil off the tank's sump. Then the tanker truck made up to the tank by adding 400 gallons of clean fuel oil. This process was repeated an additional four times so that approximately 1870 gallons of oil was bled from the tank and 1870 gallons of fresh oil was added to the tank. A subsequent bulk sample was taken on 10/10/03 and was < 0.05% water / sediment. The increased trend in water and sediment was attributed to long-term accumulation. Prior to this event, Oyster Creek did not have in place recurring tasks to periodically drain water and sediment from the bottom of fuel oil storage tanks. The use of the feed and bleed process to replace the fuel oil in the EDG Fuel Storage tank was not intended to address the root cause. Actions to prevent recurrence included the creation of quarterly periodic recurring tasks to drain accumulated water and sediment from the bottoms of the EDG Fuel Storage Tank, Fire Pond Diesel Fuel tanks, and the Main Fuel Oil Tank.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Miller, Mark 1/25/2006

Reviewed By: Muggleston, Kevin 1/25/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		*Date Received:*	*Source*
AMP-192		1/24/2006	AMP Audit
Topic:		*Status:*	Closed
Fuel Oil Chemistry			

Document References:
B.1.22

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

(Audit2-B.1.22-11): The first exception to NUREG-1801 in OCGS AMP B.1.22 states that multilevel sampling, tank bottom sampling, draining, cleaning and internal inspection of the EDG day tanks are not routinely performed at Oyster Creek. The design of the EDG day tanks does not provide the capability for sampling of the tanks. Please provide the following information related to this exception:
a) Please provide additional information to justify why these tanks cannot be sampled, drained, cleaned, or inspected.
b) Part of the justification for this exception is that the EDG day tanks are supplied directly from the EDG fuel storage tank, which is routinely sampled and analyzed. Section 3.10 of the Program Basis Document for this AMP (PBD-AMP-B.1.22) discusses operating experience in which a problem with increasing levels of water and sediment were experienced with the bottom samples and all-level samples from the EDG storage tank. Please 1) discuss the impact of this operating experience on the aforementioned exception noted for this AMP. Specifically, since a problem was identified with increasing water and sediment concentrations in the EDG fuel oil storage tank, discuss what evidence exists to assure that this increase in contaminants did not cause a current or impending problem in the EDG day tanks that has not yet been identified since these tanks are neither monitored nor inspected; 2) Discuss how the lack of future monitoring and inspecting of the EDG day tanks can be justified based upon this operating experience, and 3) Provide justification for not performing a one-time inspection of the EDG day tanks.

Assigned To: Miller, Mark

Response:

The first exception to NUREG-1801 in OCGS AMP B.1.22 states that multilevel sampling, tank bottom sampling, draining, cleaning and internal inspection of the EDG day tanks are not routinely performed at Oyster Creek.

a) The tanks are not equipped with sampling capability and periodic sampling will not be done for the day tanks. However, the day tanks will be internally inspected (one time) to confirm the absence of aging effects. Visual inspection will be performed. Further inspections will be performed to quantify the degradation should there be any evidence of corrosion or pitting observed during the visual

inspection.
b) Part of the justification for this exception is that the EDG day tanks are supplied directly from the EDG fuel storage tank, which is routinely sampled and analyzed. 1) The Operating Experience discussed in Section 3.10 of the Program Basis Document, which is further discussed in Request No.: AMP-191, identifies that the increased trend in water and sediment was attributed to long-term accumulation. Prior to this 2003 event, Oyster Creek did not have in place recurring tasks to periodically drain accumulated water and sediment from the bottom of fuel oil storage tanks. Current Oyster Creek practice includes a quarterly periodic recurring task to drain accumulated water and sediment from the bottom of the EDG Fuel Storage Tank. The EDG Fuel Storage tank is also periodically drained, cleaned, and internally inspected every 10 years and is periodically tested for water and sediment (bottom samples tested monthly; multilevel samples tested weekly and following transfer from the Main Fuel Oil Storage tank). Based on these current practices, which in part were developed as corrective actions to the 2003 event discussed above, and the fact that all sample results from that event were within specification, which is < or equal to 0.05 % water and sediment, current or impending problems in the EDG day tanks are not expected; 2) Based on the current practices discussed above, and based on the rationale provided in PBD-AMP-B.1.22 for the subject exception, the lack of periodic monitoring and inspection of the EDG day tanks during the extended period of operation is justified; 3) The effectiveness of fuel oil practices on maintaining the intended function of the EDG day tanks will be confirmed prior to entering the period of extended operation. The day tanks will be internally inspected (one time) to confirm the absence of aging effects. Visual inspection will be performed. Further inspections will be performed to quantify the degradation should there be any evidence of corrosion or pitting observed during the visual inspection.

LRCR #: 256 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 1/26/2006

Reviewed By: Muggleston, Kevin 2/10/2006

Approved By: Warfel, Don 2/10/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-193

Date Received: 1/24/2006

Source AMP Audit

Topic:

Status: Closed

Document References:
B.1.22

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

(Audit2-B.1.22-12): The second exception to NUREG-1801 in OCGS AMP B.1.22 states that OCGS has not committed to ASTM D 4057-95 (2000) for manual sampling standards. Please provide the following information related to this exception:
a) The OCGS LRA states that the EDG fuel storage tank is equipped with a sample station that includes two sample recirculation pumps and sample collection points located internal to the tank at several tank elevations, thus making the EDG fuel storage tank sample station effective for obtaining multilevel samples. The OCGS response to question AMP-033 states that there are four 3/8 tubes used for sampling the tank. The bottom sample is taken from a tube that ends ½ from the bottom of the sump, about 5 ¼ below the tank bottom. The tank sample is taken from a tube that ends ½ from the bottom of the tank. However, it is not clear from the response if these are the only two samples taken and what the other two sample tubes are used for. Please 1) clarify the sampling process for the EDG fuel storage tank. Specifically, how many separate samples are taken for each tank sampling, and from what tank elevations are they taken; and 2) please state the capacity of the EDG fuel storage tank and discuss how the sampling process meets the recommendations in NUREG-1801 and ASTM D 4057 for multilevel sampling.
b) Please 1) discuss the sampling process for the main fuel oil storage tank since this is not addressed in the exception. Specifically, provide the capacity of the tank, the number of samples taken, the tank elevation of each sample, and the process used to obtain the samples; and 2) please discuss how the sampling process meets the recommendations in NUREG-1801 and ASTM D 4057 for multilevel sampling.

Assigned To: Miller, Mark

Response:

The second exception to NUREG-1801 in OCGS AMP B.1.22 states that OCGS has not committed to ASTM D 4057-95 (2000) for manual sampling standards.
a) The OCGS LRA states that the EDG fuel storage tank is equipped with a sample station that includes two sample recirculation pumps and sample collection points located internal to the tank at several tank elevations, thus making the EDG fuel storage tank sample station effective for obtaining multilevel samples. 1) From drawings CHO 082-1 and CHO 082-2, there are four 3/8" tubes (2

sample supply tubes and 2 sample return tubes) and one 1/4" tube. The 1/4" tube bottom is 6" from the tank bottom and is capped at the top of the tank. This tube is not used. From the drawing and walkdown of the sample station, the bottom sample is taken from a 3/8" tube that ends 1/2" from the bottom of the sump (about 5 1/4" below the tank bottom). The bottom sample is pulled by a pump that recirculates the oil back into the tank through a 3/8" tube that discharges about 30" from the bottom of the tank. The tank sample is taken from a 3/8" tube that ends 1/2" from the bottom of the tank. This sample is pulled by a pump and recirculated back into the tank through a 3/8" tube that discharges about 30" from the tank bottom; 2) The EDG fuel storage tank capacity is 1500 gallons (57 m3). The requirements in ASTM D 4057-95 (2000) for tap sampling (paragraph 13.6) are most analogous to the sampling techniques employed for the EDG fuel storage tank. The requirements for a 57 m3 volume tank, and the evaluation of differences between ASTM D 4057-95 (2000) and Oyster Creek EDG fuel storage tank "multilevel" sampling, are as follows:

· Taps should be a minimum of ½" in diameter. The Oyster Creek EDG sample tubes are 3/8". This is acceptable as sample taps are gravity fed while the EDG sampling station employs sample pumps for obtaining samples.

· Sample tap and piping should be flushed until they have been completely purged. The Oyster Creek EDG sample pump is run for at least one (1) minute to flush the sample lines and establish recirculation and mixing within the tank.

· Sample tap specifications should meet the requirements of ASTM D 4057-95 (2000) Tables 6 and 7. The Oyster Creek sample taps do not meet the requirements for number of taps and vertical location of taps as specified in Tables 6 and 7. However, the sample pump provides for circulation and mixing between elevation ½" and 30" within the EDG fuel storage tank. Although the tank sample inlet is located in the lower third of the tank, with recirculation and mixing, the sample is more representative of the tank contents than a bottom or lower third sample.

b) 1) The "multilevel" sampling of the Main Fuel Oil Tank (MFOT) meets the requirements of ASTM D 4057-95 (2000) and, therefore, was not identified as an exception. The MFOT is 75,000 gallons (287 m3). The "Running or All-Level" method of ASTM D 4057-95 (2000) paragraph 13.5 is used for the MFOT. 2) Oyster Creek procedure 828.7 "Secondary Systems Analysis: Plant Oil" Section 6.1 allows for the use of either a metal sampling cage or a weighted sampling bottle as described in ASTM D 4057-95 (2000) paragraph 13.5.3.2. As described in procedure 828.7 Section 6.1, and in accordance with ASTM D 4057-95 (2000) paragraph 13.5, a clean, dried, and corked sampler is lowered from the top of the tank (through a manhole) to approximately one foot above the tank bottom. The cork is removed and the sampler is raised at a uniform rate. If the sample volume is not between 50% and 85%, it is discarded and another sample is obtained. Once an acceptable sample is obtained, it is emptied into a sample bottle if required, and capped.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 1/25/2006

Reviewed By: Getz, Stu 1/26/2006

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Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-194		1/24/2006	AMP Audit
Topic:		***Status:***	Closed

Document References:
B.1.22

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

(Audit2 B.1.22-14): The Program Basis Document for AMP B.1.22 (PBD-AMP-B.1.22) identifies a new exception to NUREG-1801 based upon the reconciliation of the draft January 2005 GALL to the approved September 2005 GALL. This exception states that Oyster Creek has not adopted the standard technical specifications documented in the NUREG-1430 series. Please provide the following information related to this exception:
a) The program basis document states that water and sediment from the EDG fuel storage tank is drained quarterly. This exceeds the standard technical specifications requirement of 31 days; however, it is aligned with 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. Please discuss the technical justification for concluding that a quarterly frequency for the EDG fuel oil storage tank is adequate for draining water and sediment in light of the operating experience in which increasing water and sediment concentrations occurred in the EDG fuel oil storage tank, as discussed in Section 3.10 (item 3) of the Program Basis Document.
b) Also, Reg Guide 1.137 recommends monthly draining for buried tanks where the ground water table is equal to or higher than the tank bottom. Please clarify whether the EDG fuel tank is buried, and, if so, what the water table level is in relation to the tank.
c) Discuss any other differences between the OCGS fuel oil specifications and procedures with regard to fuel oil purity and testing compared to the requirements in the standard technical specifications and provide the technical justification for concluding that the OCGS requirements provide an equivalent level of aging management for the period of extended operation

Assigned To: Miller, Mark

Response:

The Program Basis Document for AMP B.1.22 (PBD-AMP-B.1.22) identifies a new exception to NUREG-1801 based upon the reconciliation of the draft January 2005 GALL to the approved September 2005 GALL. This exception states that Oyster Creek has not adopted the standard technical specifications documented in the NUREG-1430 series.
a) The program basis document states that water and sediment from the EDG fuel storage tank is drained quarterly. This exceeds the standard technical specifications requirement of 31 days;

however, it is aligned with 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. The technical justification for concluding that a quarterly frequency for the EDG fuel oil storage tank is adequate for draining water and sediment in light of the operating experience is as follows: As discussed in response to Request No.: AMP-191, The increased trend in water and sediment was attributed to long-term accumulation. Prior to this event, Oyster Creek did not have in place recurring tasks to periodically drain water and sediment from the bottom of fuel oil storage tanks. Current Oyster Creek practices include quarterly periodic recurring tasks to drain accumulated water and sediment from the bottom of the EDG Fuel Storage Tank. This practice has been effective in preventing recurrence of high levels of water and sediment in the EDG fuel storage tank.

b) Reg Guide 1.137 recommends monthly draining for buried tanks where the ground water table is equal to or higher than the tank bottom. This requirement does not apply to the EDG fuel storage tank, which is an above ground tank. Aging management of this tank is addressed in the Fuel Oil Chemistry (B.1.22) and Aboveground Outdoor Tanks (B.1.21) aging management programs.

c) The standard technical specifications state in Bases B 3.8.3, For proper operation of the standby DGs, it is necessary to ensure the proper quality of the fuel oil. Regulatory Guide 1.137 addresses the recommended fuel oil practices as supplemented by ANSI N195. The fuel oil properties governed by these SRs are the water and sediment content, the kinematic viscosity, specific or API gravity, and impurity level. SR 3.8.3.3 further expands on these requirements. The fuel oil properties governed by these SRs including the water and sediment content, the kinematic viscosity, specific or API gravity, and impurity level are satisfied by the Oyster Creek fuel oil chemistry program. This program is implemented by procurement specification SP-1302-38-010 and sampling and analysis procedure CY-OC-120-1107 which are based on Regulatory Guide 1.137 Rev. 1, ANSI N195-1976, and ASTM D975-81. These implementing documents include requirements for water and sediment content, the kinematic viscosity, specific or API gravity, and impurity level for new and stored fuel consistent with the requirements identified in the referenced standard technical specifications.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Miller, Mark	1/26/2006
Reviewed By:	Getz, Stu	1/26/2006
Approved By:	Warfel, Don	1/31/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-195

Date Received: 1/24/2006

Source AMP Audit

Status: Closed

Topic:
Closed Cycle Cooling Water (CCCW)

Document References:
B.1.14

NRC Representative Villaran, Mike

AmerGen (Took Issue): Hufnagel, Joh

Question

Exception to GALL:

The September 2005 version of NUREG 1801 (GALL) refers to EPRI TR-107396 Closed Cooling Water Chemistry Guidelines. However, Oyster Creek implements the guidance provided in EPRI 1007820, Closed Cooling Water Chemistry Guideline, Revision 1 which, they claim, is the 2004 Revision to TR-107396. The applicant appropriately cites this as an exception to GALL. The basis for the exception appears to be its own review of the EPRI TR-107396, which determined that the most significant difference is that the new revision provides more prescriptive guidance and has a more conservative monitoring approach. The applicant further states that EPRI 1007820 meets the same requirements of EPRI TR-107396 for maintaining conditions to minimize corrosion and microbiological growth in closed cooling water systems for effectively mitigating aging effects.

This issue (use of EPRI 1007820 in lieu of EPRI TR-107396), was previously encountered during the Palisades review. To identify material changes that impact aging management and justify their acceptability, Palisades was to perform a comparison of the two documents and submit the results of their review to NRC for review and approval.

Was this done?¼ Seems that this would be a fairly generic issue¼Does the staff now endorse the use of EPRI 1007820 in lieu of EPRI TR-107396?

If not, should we follow the lead of Palisades and request Oyster Creek to submit the results of its comparison review to NRC for review ¼or should we request a copy of the OCNGS review (assuming it was documented) and review it ourselves?

Assigned To: Rafferty-Czincila, Shannon

Response:

Oyster Creek is currently following the guidance in EPRI TR-1007820. Oyster Creek did perform a review of the EPRI TR-107396 vs. TR- 1007820. However we did not assemble a formal white paper like the one that the NRC requested of Palisades. Exelon Corporation revised their corporate

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procedures to be in compliance with TR-1007820. These changes were reviewed and it was determined that the changes being made would not adversely affect the intent of the guidance given in TR-107396. Additionally, we spoke with the author of TR-107396 and TR- 1007820, Anthony Selby, to confirm that the new guidance that was provided in TR-1007820 was not contrary to the guidance in TR-107396. Nine Mile and Palisades have provided documentation that has been accepted by the NRC to document the difference between TR-107396 and TR- 1007820. A copy of the Palisades comparison was given to the NRC during the breakout session on 1/25/06. It can also be found in a letter from Palisades to the NRC on October 31, 2005, Docket No 50-255.
This response was discussed during the breakout session on 1/25/06.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Rafferty-Czincila, Shannon	1/25/2006
Reviewed By:	Muggleston, Kevin	1/25/2006
Approved By:	Warfel, Don	1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-196

Date Received: 1/24/2006

Source AMP Audit

Status: Closed

Topic:
CRDRL Nozzle

Document References:
B.1.06

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

PBD-AMP-B.1.06 (CRDRL Nozzle) REVISED AMP-196

The CRDRL nozzle inspection is included in the Oyster Creek ISI program plan under Category B-D, Full Penetration Welds of Nozzles in Vessels, consistent with the requirements of Table IWB 2500-1. In accordance with NUREG-0619, BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle," augmented PT examinations are to be performed for the CRD return line nozzle.

GALL AMP XI.M6 recommends the use of the NUREG-0619 recommended PT examination for the CRDRL nozzle. However, in 1994, OCGS requested and was granted relief to eliminate periodic PT examination of the nozzle blend radius area, and to utilize the most advanced UT method available at the time. This is properly noted in the PBD for OCGS AMP B.1.06.

Review of the OCGS OC-1 Program Plan, which includes CRDRL nozzle inspection, does not show the use of the augmented UT techniques.

a) Please confirm that periodic CRDRL nozzle inspections will be performed using the most advanced UT techniques, and address the process that will incorporate this requirement into the OCGS OC-1 Program Plan.

b) Since relief requests remain effective only for the current 10-year inspection interval for Section XI examination, clarify how the utilization of UT examinations in place of PT examinations will be justified for the period of extended operation.

Assigned To: May, Mike

Response:

a) OC-1 will be revised to state that the CRD RL nozzle will be inspected using the latest Performance Demonstration Initiative (PDI) UT technology available at the time the inspections are planned. This change will be tracked and implemented through the OCLR commitment tracking system in Passport as item AR# 00330592.06.03.

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b) The approval granted by the NRC in 1992 to inspect the CRD nozzle using UT in lieu of PT examination methodology has no time limit. This approval was not a relief to the ISI program in accordance with 10 CFR 50.55a and therefore does not expire with the 10-year ISI interval.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: May, Mike 1/27/2006

Reviewed By: Getz, Stu 1/27/2006

Approved By: Warfel, Don 2/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-197

Date Received: 1/24/2006

Source AMP Audit

Status: Closed

Topic:
BWR SCC Revised as 278

Document References:
B.1.07

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

(BWR SCC).THIS QUESTION HAS BEEN REVISED

ORIGINAL QUESTION
"GALL requires the carbon content and ferrite content screening criteria, as stated in the GL 88-01, to be applied to both component and weld materials, including CASS. The PBD (pg. 11 of 27) indicates that OCGS is currently applying these criteria to new and replacement components and weld materials. However, the OCGS PBD adds a new enhancement to apply the screening criteria to all new and replacement SS components in order to be consistent with GALL. Also, it is stated in the PBD (pg. 20) that numerous piping sections were replaced in conformance with the GL requirements. (a) Please discuss the screening criteria used at the time of these piping section replacements in response to GL 88-01.

REVISED QUESTION
(a) GALL requires the carbon content and ferrite content screening criteria, as stated in the GL 88-01, to be applied to both component and weld materials, including CASS.
The PBD (pg. 11 of 27) indicates that OCGS is currently applying these criteria to new and replacement components and weld materials. However, the OCGS PBD adds a new enhancement to apply the screening criteria to all new and replacement SS components in order to be consistent with GALL. Please explain why this enhancement is needed when OCGS has already been using the same criteria since the issuance of the GL 88-01.

(b) The OCGS LRA description for the BWR Stress Corrosion Cracking program (AMP B.1.7) does not include any enhancements. Please also discuss how the new enhancement discussed above will be documented as part of the LRA.

Assigned To: Rafferty-Czincila, Shannon

Response:

a) Of the original welds that were in the scope of GL 88-01, IGSCC was detected in 40 welds.

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Various piping replacements were performed in accordance with GL 88-01 in 13R. This resulted in a remaining 11 welds that were in service with indications of IGSCC. Nine were repaired with full structural overlays. Two Reactor Recirculation system welds, which were both stress improved before initial inspections determined indication of IGSCC, remained in service without repair. However, subsequent to implementation of the NRC approved Performance Demonstration Initiative (PDI), inspections performed in 2002 and 2004 using the improved PDI examination technique determined these welds did not exhibit any indication of IGSCC. Oyster Creek, therefore, does not currently have any indication of IGSCC.
Oyster Creek performed the replacements in 13R, as discussed above, in accordance with GL 88-01. However these replacements were performed as part of the implementation of GL 88-01 and it was determined that the current day documentation of the GL 88-01 commitments within the BWR Stress Corrosion Cracking Program were not to the same consistency as other program documentation. Therefore, Oyster Creek felt that enhancing the program to include specific GL 88-01 wording in the line specifications, to ensure that the GL 88-01 requirements would be clear for each system within the scope of LR, would be beneficial.

b) This change will be submitted as a supplement to the LRA. Reference LRCR (license renewal change request) #248. A copy of LRCR was provided to Mano Subudhi during the 1pm breakout session on 1/25/06.

LRCR #: 248 *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 1/25/2006

Reviewed By: Harttraft, Greg 1/25/2006

Approved By: Warfel, Don 1/31/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No	***Date Received:*** 1/24/2006
AMP-198	***Source*** AMP Audit
	Status: Closed

Topic:
BWR Penetrations Same as 279

Document References:
B.1.08

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

(BWR Penetrations)
The OCGS LRA descriptions for the BWR SCC program (AMP B.1.07) and BWR Penetrations program (AMP B.1.08) include the same exception to GALL with regard to the use of BWRVIP-29. The PBD for the AMP-B.1.07 deleted this exception as discussed in the reconciliation document. However, the exception for the AMP B.1.08 has not been deleted from the LRA and it is not mentioned in the reconciliation document. Please explain the rational for how this exception is applied.

Assigned To: May, Mike

Response:

This exception is included in PBD-B.1.8 because the program element 2, Preventive Actions, in Revision 1 of NUREG-1801, XI.M8, Penetrations, continues to refer to BWRVIP-29 for BWR water chemistry. As stated in PBD-B.1.2 and PBD-B.1.8 the Oyster Creek water chemistry program is based on BWRVIP-130, which the latest water chemistry standard from EPRI.

On the other hand, Revision 1 of NUREG-1801, XI.M7, BWR Stress Corrosion Cracking, element 2, refers to program NUREG-1801, XI.M2 for water chemistry measures, rather than to a specific water chemistry reference. NUREG-1801, XI.M7 does not refer to BWRVIP-29 or BWRVIP-130.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	May, Mike	1/26/2006
Reviewed By:	Getz, Stu	1/26/2006
Approved By:	Warfel, Don	1/30/2006

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NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-199		1/24/2006	AMP Audit
Topic:		***Status:***	Closed
Fire Protection System			

Document References:
B.1.19

NRC Representative Villaran, Mike

AmerGen (Took Issue): Hufnagel, Joh

Question

1. Scope of Enhancement Related to Diesel driven Fire Pump Fuel line Degradation (GALL Element 3)

GALL Element 3 recommends that diesel-driven fire pump tests include observation for detection of any degradation of the fuel supply line (emphasis added)

OC LRA B.1.19 states that the program will be enhanced provide specific guidance for examining the fire pump diesel fuel supply systems for corrosion during pump tests.

It is not clear why the enhancement is limited to an examination of the fuel supply system for corrosion when GALL specifically states any degradation. Under this limited examination scope, other age-related degradations such as degraded seals, worn / missing parts, holes, and general wear may be overlooked. As a result, the scope of the enhancement (which is limited to observation of corrosion) does not appear to be sufficiently broad to be considered consistent with GALL Please clarify.

Assigned To: Getz, Stu

Response:

The GALL specification in Element 3 that the diesel-driven fire pump be under observation during performance tests for detecting any degradation of the fuel supply line is satisfied by the performance of procedure 645.6.012, Fire Pump Functional Test. The test demonstrates that the fuel oil system can deliver sufficient fuel to the engine for continued operation.

The procedure is being enhanced to require a visual examination of the fuel oil supply line while the engine is operating during the test, observing the condition of the oil piping and associated components, including the existence of any surface corrosion. Procedure acceptance criteria are being enhanced to state that the fuel oil supply line does not display signs of corrosion or other degradation. The enhancement is intended to detect any degradation of the fuel supply line, including any age-related degradations such as missing parts, holes, or general wear, as would be

evident during pressurization of the line during engine operation.

The emphasis placed on corrosion is in response to GALL Element 6, which states that no corrosion is acceptable in the fuel supply line for the diesel-driven fire pump. Any signs of corrosion or mechanical damage will be evaluated to determine impact on the system and component function, with corrective actions taken as appropriate.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Getz, Stu 1/25/2006

Reviewed By: Corsi, Lou 1/26/2006

Approved By: Polaski, Fred 1/26/2006

NRC Acceptance (Date): 1/26/2006

NRC Information Request Form

Item No
AMP-200

Date Received: 1/24/2006

Source
AMP Audit

Status: Closed

Topic:
Compressed Air Monitoring

Document References:
B.1.17

NRC Representative Villaran, Mike

AmerGen (Took Issue): Hufnagel, Joh

Question

The PBD-AMP-B.1.17, Section 3.4 a) indicates that dew point is continuously monitored. At what point(s) in the system is this done? Is there an alarm associated with high dew point? If so what is the alarm response?

Assigned To: Micklo, Charles

Response:

The dew point is monitored by alarm at the dryers and read from a dew point indicator located at the dryer outlet during operator rounds each shift.
The alarm response if high humidity is confirmed at the hygrometer is to change to the alternate dryer tower set and leave the alarming dryer tower set in standby to regenerate.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Micklo, Charles 1/26/2006

Reviewed By: Quintenz, Tom 1/26/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-201

Date Received: 1/24/2006

Source AMP Audit

Status: Closed

Topic:
Open Cycle Cooling Water (OCCW)

Document References:
B.1.13

NRC Representative Villaran, Mike

AmerGen (Took Issue): Hufnagel, Joh

Question

I. LRA AMP B.1.13, Open Cycle Cooling Water (OCCW)

1. Inspection of Underground Piping

Generic Letter 89-13, Supplement 1, _ IV, C, (pg. 34) states that the inspection of underground piping can be omitted only if additional justification (operational data and prior history) is available and an evaluation clearly shows that an inspection of the underground piping would not be necessary.

The design basis document PBD-AMP-B.1.13, states that since aboveground and buried piping are subject to the same internal environments and failure mechanisms, the volumetric inspections of aboveground piping bound the buried portions of piping. However, the document does not include or reference the engineering evaluation that was performed to support this conclusion. Please provide.

2. Inspection of New Piping.

The LRA states that the OCCW system program is an existing program that, with the incorporation of the following enhancements, will be consistent with NUREG-1801, Section XI.M20 (GALL):

The Open-Cycle Cooling Water aging management program will be enhanced to include:

-Volumetric inspections, for piping that has been replaced, at a minimum of 4 aboveground locations every 4 years based on the observed and anticipated performance of the new pipe.

-Specificity on inspection of heat exchangers for loss of material due to general, pitting, crevice, galvanic and microbiologically influenced corrosion in the RBCCW, TBCCW and Containment Spray preventative maintenance tasks.

The (new) design basis document (PBD-AMP-B.1.13, Revision 0) states that the enhancement to perform volumetric inspections for new piping (enhancement #1 above) is applicable to the following GALL Elements:

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· Element 1, Scope;
· Element 3, Parameters Monitored or Inspected;
· Element 4, Detection of Aging Effects;
· Element 5, Monitoring and Trending

It appears that the inspection of all aboveground piping that is exposed to raw water (regardless of age) is included in the existing program that is governed by SP-1302-12-261, "Specification for Pipe Integrity Inspection Program" which directs UT inspections be performed on various sections of aboveground ESW and SW piping every two years. Per SP-1302-12-261, the specific sections of piping to be inspected are determined by Engineering and do not appear to be limited to only those sections of piping that were original to the plant design. Therefore, it appears that the inspection of all ESW and SW piping, including new piping, would be bounded by the current program. It is not clear why the performance of UT inspections of new pipe at a reduced frequency is considered to be an enhancement rather than an exception to the existing program. Please clarify.

Assigned To: Rafferty-Czincila, Shannon

Response:

1. The exterior environment has no impact on the aging effects of the internal environment of the pipe. Additionally, the operating experience at Oyster Creek has demonstrated that the failure mechanism that has been found in the aboveground and buried piping, that are subject to the same internal environments and failure mechanisms, are the same. This response was discussed during the break-out session on 1/25/06.

2.The enhancement only applies to new replaced piping. The minimum of 10 locations every 2 years on the existing piping will not change, therefore this is not an exception. This response was discussed during the break-out session on 1/25/06.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 1/25/2006

Reviewed By: Muggleston, Kevin 1/25/2006

Approved By: Warfel, Don 1/25/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-202

Date Received: 1/24/2006

Source
AMP Audit

Status: Closed

Topic:
Fire Water System

Document References:
B.1.20

NRC Representative Villaran, Mike

AmerGen (Took Issue): Hufnagel, Joh

<u>Question</u>

1. The LRA and FSAR Supplement state that prior to the period of extended operation, the program will be enhanced to include visual inspection of the redundant fire water storage tank heater during tank internal inspections

PBD AMP B.1.20, Section 2.4 states that the Oyster Creek Fire Water System aging management program will be enhanced to include visual inspection of the water storage tank heater pressure boundary components during the periodic tank internal inspection.

This enhancement does not appear to be identified / discussed in Section 3.0 (comparison to individual GALL Elements). Please clarify.

2. NFPA 25 (1998 Edition) Section 2-3.1.1 or Section 5.3.1.1.1 (2002 Edition) directs replacement or representative sampling and field service testing of sprinklers that have been in place for 50 years. What is the starting point of the 50-year clock? Is it the date the fire system is initially pressurized and place in service? Is there documentation for initial date of service for all the sprinklers, even those going back to the original installation?

3. NFPA 25 is not on the list of codes and standards used in the design and installation of the fire protection system. NFPA 25 needs to be identified in the FSAR regarding its role as guidance standard for the testing and maintenance of sprinklers during the period of extended operation.

4. What administrative controls are used to track program enhancement commitments, procedure development, and activities, such as the 50 year sprinkler inspection commitment, that will not commence until well into the period of extended operation?

Assigned To: Muggleston, Kevin

<u>Response:</u>

1. PBD-AMP-B.1.20 will be revised to include this enhancement in the Program Basis Document

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Section 3.1, Program Scope.

2. Oyster Creek construction was complete and operation began in April 1969. The initial plant construction period was approximately 4 years, so the earliest date for sprinkler installations would be early to mid 1965. In accordance with NFPA standards, sprinkler head sampling is recommended after 50 years in service, with additional sampling at 10-year intervals thereafter. The beginning of the 50-year clock will conservatively be established as January 1, 1965. Sprinkler head sample testing will therefore commence on or before January 1, 2015.

3. The commitment to perform sprinkler head inspections in accordance with NFPA 25 is clearly identified in the LRA Appendix A UFSAR Supplement for the Fire Water System aging management program. It is not necessary to make conforming changes to other UFSAR sections to reflect this commitment.

4. Commitments are tracked in the Passport commitment tracking system, which includes automatic tracking and reporting of required activity due dates.

LRCR #: 252 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 11/24/2006

Reviewed By: Getz, Stu 1/24/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		*Date Received:*	*Source*
AMP-203		1/24/2006	AMP Audit
Topic:		*Status:*	Accepted by NRC
IWE			

Document References:
B.1.27

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

Question 1 PBD-AMP-B.1.27 IWE Jan'06

P. 6 of the PBD states Subsection IWE aging management program bolt preload is not checked by either a torque or tension test, rather acceptance is based on Appendix J testing of associated bolted components and a general visual examination, as authorized in accordance with 10 CFR 50.55a (a)(3)(i). It appears that App. J leak rate testing has been substituted for IWE Category E-G:

E-G Pressure retaining bolting Visual VT-1, bolt torque or tension test

10 CFR 50.55a (a)(3)(i) states the proposed alternatives would provide an acceptable level of quality or safety. Please provide the technical basis for concluding that this is not considered to be an exception to GALL.

Assigned To: Ouaou, Ahmed

Response:

The use of 10 CFR Part 50 Appendix J Leak Rate Testing for Examination Category EG, pressure bolting, is an approved alternative for the current 10-Year Inspection Interval in accordance with 10 CFR 50.55a. This interval is effective from September 9, 1998 and expires in September 9, 2008 prior to entering the period of extended operation. Inspection of pressure retaining bolting, during the period of extended operation, will be in accordance with ASME Section XI, Subsection IWE as approved by 10 CFR 50.55a.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 1/26/2008

NRC Information Request Form

Reviewed By:	Getz, Stu	1/26/2006
Approved By:	Warfel, Don	1/30/2006
NRC Acceptance (Date):		

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-204		1/24/2006	AMP Audit
Topic:		***Status:***	Closed
IWE			

Document References:
B.1.27

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

<u>Question</u>

P. 7 of the PBD states Oyster Creek credits the protective coatings on interior surfaces of the suppression chamber (Torus) shell, and the vent system to mitigate corrosion. In addition Oyster Creek also relies on protective coatings on the exterior surfaces of the drywell shell, in the former sand bed region, to mitigate corrosion in accordance with a current licensing basis (CLB) commitment. For the current term, the protective coatings are monitored on frequency of every other refueling outage under the Protective Coating Monitoring and Maintenance Program. These coated areas will be monitored under the Protective Coating Monitoring and Maintenance Program consistent with ASME Section XI, Subsection IWE requirements during the period of extended operation. This constitutes a new enhancement that will be reflected in Protective Coating Monitoring and Maintenance Program." Please explain in more detail this new enhancement. How does it differ from the previous commitment? Where is this addressed in the protective coatings program PBD?

Assigned To: Ouaou, Ahmed

<u>Response:</u>

Response to this question has been provided in response to Audit Question No. AMP-188, related to the Protective Coating Monitoring and Maintenance Program (B.1.33).

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By:	Ouaou, Ahmed	1/26/2006
Reviewed By:	Getz, Stu	1/26/2006
Approved By:	Warfel, Don	1/31/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-205

Date Received: 1/24/2006

Source AMP Audit

Status: Accepted by NRC

Topic:
IWE

Document References:
B.1.27

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

P. 7 of the PBD states Under the current term, Oyster Creek is committed to NRC to monitor the former sand bed region drains for water leakage. The commitment is to investigate the source of leakage, take corrective actions, evaluate the impact of the leakage and, if necessary perform additional drywell inspections. This commitment will be implemented during the period of extended operation. This is a new commitment not previously identified in the LRA. Please describe this commitment in more detail. Is this continuous monitoring or outage monitoring? What have been the results of the current water leakage monitoring activities, with respect to investigating the source of leakage, taking corrective actions, evaluating the impact of the leakage and, if necessary performing additional drywell inspections. If no water leakage has been detected under this commitment, please describe any preventive actions taken to alleviate the previous water leakage problem.

Assigned To: Quintenz, Tom

Response:

The commitment for monitoring the sand bed drains is contained in NRC Safety Evaluation Report (SER) transmitted in a letter dated November 1, 1995. This SER requested a commitment be made to perform inspections "3 months after the discovery of any water leakage". Subsequent correspondence from GPUN clarified the commitment after discussions with the NRC. The commitment made and accepted by the NRC in a letter dated February 15, 1996, was to perform additional inspections of the drywell 3 months after discovery of any water leakage "during power operation between scheduled drywell inspections. The requirement was not meant to apply to minor leakage associated with normal refueling activities". This in part is believed to be the present commitment and the commitment contained in PBD-AMP-B.1.27.

There are no current formal leakage monitoring activities in place. Although not formalized, there has been no reported evidence of leakage from the former sand bed drains. Issue Report #348545 was been submitted into the corrective action program when this was discovered. Corrective actions have been initiated to create recurring activities controlled with the work management process and procedures, to perform all future required inspections to meet the present commitment. Since there has been no reported leakage, there has been no need to "investigating the source of leakage, taking

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corrective actions, evaluating the impact of the leakage and, if necessary performing additional drywell inspections".

Actions taken to alleviate the previous water leakage problem have been numerous, since the discovery of the leakage, and consequential drywell shell corrosion. Some of the significant actions consisted of inspections of the reactor cavity wall, remote visual inspection of the trough area below the reactor cavity bellows seal area, and subsequent repair of the trough area and clearing of the drain from the trough area. Clearing of the trough drain and repair of the trough assure routing of any leakage away from the drywell shell. In addition, a strippable coating is applied to the Reactor Cavity Walls prior to filling the reactor cavity with water to minimize the likelihood of leakage into the trough area. These preventive actions have resulted in the lack of evidence of leakage over the years at the former sandbed drains.

LRCR #: ***LRA A.5 Commitment #:***

IR#: 348545

Approvals:

Prepared By: Quintenz, Tom 1/27/2006

Reviewed By: Ouaou, Ahmed 1/27/2006

Approved By: Warfel, Don 1/31/2006

NRC Acceptance (Date): 1/27/2006

NRC Information Request Form

Item No
AMP-206

Date Received: 1/24/2006

Source AMP Audit

Status: Accepted by NRC

Topic:
IWE

Document References:
B.1.27

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

P. 11 of the PBD states The Oyster Creek ASME Section XI, Subsection IWE aging management program plan credits tests performed in accordance with 10 CFR Part 50, Appendix J for leak-tightness of seals, and gaskets. No alternatives to the VT-3 visual examination of the seals and gaskets are performed such as a torque test. The containment design does not incorporate a moisture barrier" It appears that App. J leak rate testing has been substituted for IWE Category E-D:

E-D	Seals, gaskets, and moisture barriers	Visual VT-3

10 CFR 50.55a (a)(3)(i) states the proposed alternatives would provide an acceptable level of quality or safety. Please provide the technical basis for concluding that this is not considered to be an exception to GALL?

Assigned To: Ouaou, Ahmed

Response:

The use of 10 CFR Part 50 Appendix J Leak Rate Testing for Examination Category EG, pressure bolting, is an approved alternative for the current 10-Year Inspection Interval in accordance with 10 CFR 50.55a. This interval is effective from September 9, 1998 and expires in September 9, 2008 prior to entering the period of extended operation. Inspection of pressure retaining bolting, during the period of extended operation, will be in accordance with ASME Section XI, Subsection IWE as approved by 10 CFR 50.55a.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 1/26/2006

NRC Information Request Form

Reviewed By:	Getz, Stu	1/26/2006
Approved By:	Warfel, Don	1/31/2006
NRC Acceptance (Date):		

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-207		1/24/2006	AMP Audit
Topic:		***Status:***	Accepted by NRC
IWE			

Document References:
B.1.27

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

P. 11 of the PBD states The Oyster Creek ASME Section XI, Subsection IWE aging management program manages the aging effect of loss of material, crack initiation and growth, loss of preload, loss of sealing, and fretting or lockup for the containment components, and environments listed in Table 5.2. Table 5.2 lists,

Containment Vacuum Breakers	Closure Bolting	Carbon and low aloy steel	Indoor Air (External)	Loss Of Preload
Primary Containment	Seals, Gaskets, and O-rings	Elastomer	Containment Atmosphere (External)	Loss of Sealing

Please explain these entries in light of earlier statements on pages 6 and 11. See questions 1 and 4 above.

Assigned To: Ouaou, Ahmed

Response:

The use of "Oyster Creek ASME Section XI, Subsection IWE" means ASME Section XI, Subsection IWE as approved by 10CFR50.55a, including any approved alternatives for the current 10-Year Inspection Interval. The apparent discrepancy between the statement in page 6 and page 11 is due to the fact that in page 6 refers to the approved alternative (Appendix J leak testing) and not "Oyster Creek ASME Section XI, Subsection IWE".

As clarified in Audit Questions No. AMP-203, and AMP-206, the current 10-Year Inspection Interval is effective from September 9, 1998 and expires in September 9, 2008 prior to entering the period of extended operation. Thus inspection of closure bolting, seals, gaskets, and O-rings for Containment Vacuum Breakers and for the Primary Containment during the period of extended operation, will be in accordance with ASME Section XI, Subsection IWE as approved by 10 CFR 50.55a.

LRCR #: ***LRA A.5 Commitment #:***

NRC Information Request Form

IR#:

Approvals:

Prepared By:	Ouaou, Ahmed	1/27/2006
Reviewed By:	Getz, Stu	1/27/2006
Approved By:	Warfel, Don	1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-208

Date Received: 1/24/2006

Source AMP Audit

Status: Closed

Topic:
IWE

Document References:
B.1.27

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

P. 14 of the PBD states Oyster Creek elected not to implement the weld examination requirement for Code Categories E-B and E-F as allowed by 10 CFR 50.55a(b)(2)(ix)(C). However, the weld examinations are included in Categories E-A and E-F as accessible surface area inspections. Please clarify this statement. The second reference to E-F appears to be an error.

Also, please confirm that only Categories E-A and E-C of IWE are actually implemented.

Assigned To: Quintenz, Tom

Response:

The category EF in the statement "However, the weld examination are included in categories E-A and E-F as accessible surface area inspections." is redundant and misleading. The statement should state that "However, the weld examinations are included in categories E-A".
Oyster Creek implements Category E-A for containment surfaces and E-C for containment surfaces requiring augmented examinations.

LRCR #: 262 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 2/ 1/2006

Reviewed By: Muggleston, Kevin 2/ 1/2006

Approved By: Warfel, Don 2/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-209

Date Received: 1/24/2006

Source AMP Audit

Status: Open

Topic:
IWE

Document References:
B.1.27

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

P. 17 of the PBD states
As discussed with NRC Staff during the AMP audit, Oyster Creek will perform one-time UT thickness measurements of the drywell shell, in the sand bed region, to confirm that the protective coating is effective. The UT measurements will be taken from inside the drywell at the same or approximate locations measured in 1996. This constitutes a new commitment that will implemented prior to entering the period of extended operation.
Has this been added to the scope of the One Time Inspection program? How will this commitment be tracked and implemented? Are the locations selected for one-time inspection those that had the minimum remaining thickness based on prior UT results? If not, explain why the selected locations are adequate. What steps will be taken if the current conclusion, that corrosion has been arrested, is not confirmed by the one-time inspection?
Also, please discuss the scope of the current coating inspection program and the LR commitment. What % of the total circumference is inspected during each inspection? How many years and how many inspections does it take to complete a 360 degree inspection of the sandbed region? Has a complete 360 degree inspection been completed yet? How many will be completed during the LR period?

Assigned To: Ouaou, Ahmed

Response:

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By:

Reviewed By:

NRC Information Request Form

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-210		1/24/2006	AMP Audit
Topic:		***Status:***	Open
IWE			

Document References:
B.1.27

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

Pages 25 through 31 of the PBD present a discussion of the OCGS operating experience.

(8a)The following statements related to drywell corrosion in the sandbed region need further explanation and clarification:
As a result of the presence of water in the sand bed region, extensive UT thickness measurements (about 1000) of the drywell shell were taken to determine if degradation was occurring. These measurements corresponded to known water leaks and indicated that wall thinning had occurred in this region.
Please explain the underlined statement. Were water leaks limited to only a portion of the circumference? Was wall thinning found only in these areas?
After sand removal, the concrete surface below the sand was found to be unfinished with improper provisions for water drainage. Corrective actions taken in this region during 1992 included; (1) cleaning of loose rust from the drywell shell, followed by application of epoxy coating and (2) removing the loose debris from the concrete floor followed by rebuilding and reshaping the floor with epoxy to allow drainage of any water that may leak into the region. UT measurements taken from the outside after cleaning verified loss of material projections that had been made based on measurements taken from the inside of the drywell. There were, however, some areas thinner than projected; but in all cases engineering analysis determined that the drywell shell thickness satisfied ASME code requirements.
Please describe the concrete surface below the sand that is discussed in paragraph above.
Please provide the following information:
(1) Identify the minimum recorded thickness in the sand bed region from the outside inspection, and the minimum recorded thickness in the sand bed region from the inside inspections. Is this consistent with previous information provided verbally? (.806 minimum)
(2) What was the projected thickness based on measurements taken from the inside?
(3) Describe the engineering analysis that determined satisfaction of ASME code requirements and identify the minimum required thickness value. Is this consistent with previous information provided verbally? (.733 minimum)
(4) Is the minimum required thickness based on stress or buckling criteria?
(5) Reconcile and compare the thickness measurements provided in (1) and (3) above with the .736 minimum corroded thickness that was used in the NUREG-1540 analysis of the degraded Oyster

Creek sand bed region.

Evaluation of UT measurements taken from inside the drywell, in the in the former sand bed region, in 1992, 1994, and 1996 confirmed that corrosion is mitigated. It is therefore concluded that corrosion in the sand bed region has been arrested and no further loss of material is expected. Monitoring of the coating in accordance with the Protective Coating Monitoring and Maintenance Program, will continue to ensure that the containment drywell shell maintains its intended function during the period of extended operation.
NUREG-1540, published in April 1996, includes the following statements related to corrosion of the Oyster Creek sandbed region: (page vii) However, to assure that these measures are effective, the licensee is required to perform periodic UT measurements. and (page 2) As assurance that the corrosion rate is slower than the rate obtained from previous measurements, GPU is committed to make UT measurements periodically. Please reconcile the aging management commitment (one-time UT inspection and monitoring of the condition of the coating) with the apparent requirement/commitment documented in NUREG-1540.

(8b)The following statement related to drywell corrosion above the sandbed region needs further explanation and clarification:

Corrective action for these regions involved providing a corrosion allowance by demonstrating, through analysis, that the original drywell design pressure was conservative. Amendment 165 to the Oyster Creek Technical Specifications reduced the drywell design pressure from 62 psig to 44 psig. The new design pressure coupled with measures to prevent water intrusion into the gap between the drywell shell and the concrete will allow the upper portion of the drywell to meet ASME code requirements.

Please describe the measures to prevent water intrusion into the gap between the drywell shell and the concrete that will allow the upper portion of the drywell to meet ASME code requirements". Are these measures to prevent water intrusion credited for LR? If not, how will ASME code requirements be met during the extended period of operation?

(8c)The following statements related to torus degradation need further explanation and clarification:
Inspection performed in 2002 found the coating to be in good condition in the vapor area of the Torus and vent header, and in fair condition in immersion. Coating deficiencies in immersion include blistering, random and mechanical damage. Blistering occurs primarily in the shell invert but was also noted on the upper shell near the water line. The fractured blisters were repaired to reestablish the protective coating barrier. This is another example of objective evidence that the Oyster Creek ASME Section XI, Subsection IWE aging management program can identify degradation and implement corrective actions to prevent the loss of the containment's intended function.
While blistering is considered a deficiency, it is significant only when it is fractured and exposes the base metal to corrosion attack. The majority of the blisters remain intact and continues to protect the base metal; consequently the corrosion rates are low. Qualitative assessment of the identified pits indicate that the measured pit depths (50 mils max) are significantly less than the criteria established

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in Specification SP-1302-52-120 (141- 261 mils, depending on diameter of the pit and spacing between pits).

Please confirm or clarify (1) that only the fractured blisters found in this inspection were repaired; (2) pits were identified where the blisters were fractured; (3) pit depths were measured and found to 50 mils max; (4) the inspection Specification SP-1302-52-120 includes pit-depth acceptance criteria for rapid evaluation of observed pitting; (5) the minimum pit depth of concern is 141 mils (.141) and pits as deep as 261 mils (.261) may be acceptable.

Please also provide the following information: nominal design, as-built, and minimum measured thickness of the torus; minimum thickness required to meet ASME code acceptance criteria; the technical basis for the pitting acceptance criteria include in Specification SP-1302-52-120

Assigned To: Ouaou, Ahmed

Response:

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:

Reviewed By:

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-211

Date Received: 1/24/2006

Source AMP Audit

Status: Closed

Topic:
Fire Protection System

Document References:
B.1.19

NRC Representative Villaran, Mike

AmerGen (Took Issue): Hufnagel, Joh

Question

The FSAR and LRA must be updated / revised for consistency with PDB B.1.19

As described below the FP Basis Document (PDB B.1.19) identifies several enhancements that are not addressed in the LRA or FSAR supplement.

· Detection of Aging Effects (Element 4) - Enhancement not identified in FSAR or LRA

GALL Element 4 states that visual inspections should be performed by fire protection qualified inspectors. The Basis Document (Pg. 19 Section Oyster Creek (c)) states Personnel performing inspections will be qualified and trained to perform the inspection activities. Is this an enhancement? If so, why is it not identified as such in the LRA and FSAR Supplement?

· Detection of Aging Effects (Element 4) - Enhancement not identified in LRA

GALL Element 4 states that visual inspection by fire protection qualified inspectors should be performed to detect signs of degradation of the fire door such as wear and missing parts. The Basis Document states: The program will direct that fire doors in the scope of license renewal are to be visually inspected by designated qualified personnel for signs of degradation such as wear, missing parts, holes, and clearances....This appears to be another example of an enhancement that is not identified in the LRA or FSAR Supplement .

· Detection of Aging Effects (Element 4) - Enhancement not identified in FSAR or LRA

GALL Element 4 states that visual inspection by fire protection qualified inspectors should be performed to detect signs of degradation of the fire door such as wear and missing parts. The Basis Document states: Enhancements to the program direct visual inspection of the fire door for integrity of door surfaces, and clearance checks every two years. This appears to be another example of an enhancement is not identified in the LRA or FSAR Supplement .

·Monitoring and Trending (Element 5) - Enhancement not in FSAR or LRA

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GALL Element 5 states that degraded integrity or clearances in the fire door are detectable by visual inspection performed on a plant specific frequency. The Basis Document states that prior to the period of extended operation, the program will be enhanced to require that surface integrity and clearances of fire doors in the scope of license renewal be routinely inspected every two years. This appears to be another example of an enhancement that is not identified in the LRA or FSAR Supplement.

·Acceptance Criteria (Element 6) - Enhancements not identified in LRA or FSAR

Assigned To: Getz, Stu

Response:

Item 1 (Element 4):

This is not an enhancement. Personnel performing fire barrier inspections at Oyster Creek are and will continue to be qualified and trained to perform inspection activities.

Item 2 (Element 4):

The existing Oyster Creek fire protection program directs inspection of fire doors every 24 months to verify the doors are intact, and inspection every 6 months to verify the doors are functional. In response to AMP-105, Oyster Creek has clarified its intention to perform inspection of fire doors in the scope of license renewal for integrity of door surfaces and clearance checks every two years. This has been added as an enhancement subsequent to the submittal of the LRA and is included in the FSAR supplement draft Appendix A paragraph included in the PBD notebook. The added enhancement states that the Fire Protection aging management program will be enhanced to include criteria for routine inspection of surface integrity and clearances for fire doors in the scope of license renewal.

Item 3 (Element 4):

In response to AMP-105, Oyster Creek has clarified its intention to perform inspection of fire doors in the scope of license renewal for integrity of door surfaces and clearance checks every two years. This has been added as an enhancement subsequent to the submittal of the LRA and is included in the FSAR supplement draft Appendix A paragraph included in the PBD notebook. The added enhancement states that the Fire Protection aging management program will be enhanced to include criteria for routine inspection of surface integrity and clearances for fire doors in the scope of license renewal.

Item 4 (Element 5):

In response to AMP-105, Oyster Creek has clarified its intention to perform inspection of fire doors in the scope of license renewal for integrity of door surfaces and clearance checks every two years. This has been added as an enhancement subsequent to the submittal of the LRA and is included in

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the FSAR supplement draft Appendix A paragraph included in the PBD notebook. The added enhancement states that the Fire Protection aging management program will be enhanced to include criteria for routine inspection of surface integrity and clearances for fire doors in the scope of license renewal.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Getz, Stu 1/25/2006

Reviewed By: Corsi, Lou 1/26/2006

Approved By: Polaski, Fred 1/26/2006

NRC Acceptance (Date): 1/26/2006

NRC Information Request Form

Item No
AMP-212

Date Received: 1/24/2006

Source AMP Audit

Status: Closed

Topic:
Compressed Air Monitoring

Document References:
B.1.17

NRC Representative Villaran, Mike

AmerGen (Took Issue): Hufnagel, Joh

Question

The PBD-AMP-B.1.17, Section 3.10, 2nd paragraph on page 19 indicates that there is a "review of program-related ops experience by the program owner". Is this a formal process controlled by PM program or some other admin controls? What is the frequency of the ops experience review cycle? Is the program owner a system engineer assigned to the instrument air system? Is this review formally documented?

Assigned To: Micklo, Charles

Response:

External OE review and response is controlled by the Operating Experience Procedure, LS-AA-115. Assignments are made daily and a due date commensurate with the risk significance of the issue is assigned, none longer than 4 months. Oyster Creek OE review is incorporated into the System Health Indicator Program, ER-AA-2002. Reports are prepared and issued quarterly. Semi annual reports incorporate industry events. Significant issues are entered into and controlled by the Corrective Action Program, LS-AA-125.

The Compressed Air Monitoring program owner is also the Instrument Air system engineer.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Micklo, Charles 1/26/2006

Reviewed By: Quintenz, Tom 1/26/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-213		1/24/2006	AMP Audit
Topic:		***Status:***	Closed

Fire Protection System

Document References:
B.1.19

NRC Representative Villaran, Mike

AmerGen (Took Issue): Hufnagel, Joh

Question

Operating Experience

Acceptance of the exception to this AMP (or any other AMP) relies heavily on the operating experience with the current program. In support of the exception related to the frequency of visual inspections and functional testing of the halon and CO2 fire suppression systems (i.e., 18mos vs. 6 mos), Section 3.10 of the Basis Document (PDB B.1.19) states:

Review of Oyster Creek operating experience has shown no loss of material on the external surfaces of components in the halon and low-pressure carbon dioxide systems that have adversely affected system operation.

From this statement it is not clear if age-related degradations, other than those that were specifically attributed to a loss of material on the external surfaces of components have occurred that adversely affected system operation. Did the the OE review identify any occurrence of aging-related events that adversely affected system operation?

Assigned To: Getz, Stu

Response:

The operating experience review of the halon and low-pressure carbon dioxide fire suppression systems performed for the Oyster Creek LRA did not identify any loss of material on the external surfaces of components that have adversely affected system operation.

A subsequent operating experience review performed for the response to this AMP question did identify a recent occurrence (2005) of evidence of corrosion on a CARDOX tank located outside the south side of the Turbine Building. An entry was made into the corrective action program for evaluation of the corrosion and repair of the tank. The system remained available and fully functional. System operation was not adversely affected by the condition. Addition of weather protection for the tank is being considered as a long-term improvement. (CAP O2005-2104)

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A search of the CAP operating experience system back to 1996 for occurrences of any other age-related degradation such as worn or missing parts, holes, or wear of components in either the halon or low-pressure carbon dioxide fire suppression systems did not identify any aging-related events that adversely affected system operation.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Getz, Stu 1/25/2006

Reviewed By: Corsi, Lou 1/26/2006

Approved By: Polaski, Fred 1/26/2006

NRC Acceptance (Date): 1/26/2006

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Item No		***Date Received:***	***Source***
AMP-214		1/25/2006	AMP Audit
Topic:		***Status:***	Closed
Fatigue Monitoring			

Document References:
PBD-B.3.1

NRC Representative Hsu, Robert

AmerGen (Took Issue): May, Mike

Question

Please clarify the apparent discrepancy between the CUF values stated for the feedwater line in Tables 5.4 and 5.5 of PBD-B.3.1.

Assigned To: May, Mike

Response:

Table 5.4 of PBD-AMP-B.3.01 will be revised to reflect the correct valves for cumulative usage factor (CUF) that are tracked in the Metal Fatigue of Reactor Coolant Pressure Boundary aging management program. The CUF values for the feedwater line, Recirculation line will be changed to be in agreement with Table 5.5 of the PBD. The markup of the affected page is attached. The change to the PBD is tracked by LRCR #255.

In addition the CUF for the Isolation Condenser will be changed to reflect the most recent analysis of the Isolation Condenser components. The new Isolation Condenser fatigue analysis only addresses the most limiting location as displayed in the attached markup.

Additionally, the CUF for Isolation Condenser line primary containment penetration will be updated to reflect the correct value of allowable cycles for the penetration. The CUF of 0.743 stated in the current PBD was taken from an older analysis of the penetration and incorrectly captured in Table 5.4 of the PBD.

LRCR #: 255 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: May, Mike 2/ 7/2006

Reviewed By: Getz, Stu 2/ 8/2006

NRC Information Request Form

Approved By: Warfel, Don 2/10/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-215

Date Received:

Source
AMP Audit

Topic:
Fatigue analysis for Isolation Condenser not available

Status: Closed

Document References:

NRC Representative Hsu, Robert

AmerGen (Took Issue): May, Mike

Question

Please provided the completed fatigue analysis for the Oyster Creek Isolation that is used in FatiguePro.

Assigned To: May, Mike

Response:

The fatigue analysis for the Oyster Creek Isolation Condenser has been completed. A copy of the analysis will be available at AMR audit (Feb 13 - Feb 18) audit.

LRCR #: 255 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: May, Mike 2/ 8/2006

Reviewed By: Rafferty-Czincila, Shannon 2/ 8/2006

Approved By: Warfel, Don 2/ 8/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-216

Date Received: 1/24/2006
Source Info Only

Topic:
Errors in Code Case N-284 revision 0.

Status: Void

Document References:

NRC Representative

AmerGen (Took Issue): Warfel, Don

Question

Review CLB analysis to determine what codes and code-cases, including revison number, were used for the analysis of Drywell Shell.

Assigned To: Ouaou, Ahmed

Response:

The Drywell buckling analysis was conducted in 1992 using Code Case N-284 Rev. 0. According to NRC Audit team this revision of the code case contained several errors that were corrected in revision 1. The LR team reported to the Audit team that revision 0 was used for analysis since Rev. 1 was not issued until 1995. Station personnel indicated that Chicago Bridge &Iron (CB&I) was consulted after revision 1 of the Code Case was issued. CB&I indicated that revision 1 of the Code Case has no impact on the Oyster Creek analysis conducted in accordance with Revision 0 of the Code Case.

The NRC Audit team reviewed the Code Case and concluded that buckling analysis conducted in accordance with Revion 0 is acceptable and that revision 1 had no significant impact on the analysis.

This is not an NRC Question and requires no response to NRC. The topic came up during AMP-B.1.27 breakout session and did not result in a formal NRC question.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 1/30/2006

Reviewed By: N/A

Approved By: Warfel, Don 2/ 7/2007

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NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-217

Date Received: 1/25/2006

Source AMP Audit

Topic:
Electrical Cables & Connections not subject to EQ Requiremen

Status: Closed

Document References:
B.1.34

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

How are the 60-year limiting service environment parameters monitored and controlled such that the current licensing basis of the electrical commodities is maintained through the period of extended operation?

Assigned To: Spamer, Deb

Response:

Oyster Creek 60-year service limiting environmental parameters are delineated in Engineering Standard, ES-027, Environmental Parameters Oyster Creek NGS, Revision 4, which is included as a reference in the B.1.34 program basis document. Environmental parameters are controlled by Oyster Creek's environmental qualification program (see program basis document PBD-AMP-B.3.2). AMP audit question number AMP-163 addresses environmental monitoring for the environmental qualification program. A copy of AMP-163 was provided to NRC AMP Audit team member Roy Matthews.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 1/25/2006

Reviewed By: Corsi, Lou 1/25/2006

Approved By: Polaski, Fred 1/26/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-218

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
Electrical Cables & Connections not Subject to EQ Requiremen

Document References:
B.1.34

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

CAP 2002-813 identified cracking of cable insulation. Provide basis to show that the actions taken to-date or will be taken to address the cable degradation issue has been adequately incorporated in the aging management program to ensure the current licensing basis is maintained through the period of extended operation?

Assigned To: Spamer, Deb

Response:

CAP O2002-0813 discusses cable insulation degradation in diesel generator control circuitry located within a control panel. This issue was discovered during a routine, every 6-month, inspection. This instance of cable insulation degradation is considered an isolated instance and is not indicative of a new or different aging mechanism requiring aging management. Supporting this conclusion is the following information:
-This was the only instance of diesel generator control circuitry insulation degradation found during operating experience searches. If this type of insulation degradation had been a recurring issue, additional issue reports would have been entered into Oyster Creek's corrective action process or a common cause issue report would have been initiated to evaluate repeat occurrences (per the requirements and demonstrated performance of Oyster Creek's corrective action process).
-This type of failure/observation of a component/commodity does not typically warrant aging management as part of license renewal because it is part of an active component that is periodically inspected, surveiled, tested or maintained.
-This item was identified during a routine 6-month inspection. It was not associated with an equipment failure or malfunction.
Based on the reasoning above, this instance of operating experience, is considered an isolated instance and does not indicate a new or different aging mechanism or a need to incorporate this issue into the B.1.34 AMP. Additionally, this operating experience does not indicate a need to amend the Oyster Creek GALL-consistent implementation of NUREG-1801, Section XI.E1, Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements aging management program.

LRCR #: ***LRA A.5 Commitment #:***

NRC Information Request Form

IR#:

Approvals:

Prepared By:	Spamer, Deb	1/25/2006
Reviewed By:	Corsi, Lou	1/25/2006
Approved By:	Polaski, Fred	1/26/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-219

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
Electrical Cables & Connections not subj to EQ used in Instr

Document References:
B.1.35

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

Is there any enhancement or exception identified for element #10? Provide basis and applicable documents why OCNGS do not need any enhancement.
Caps 002-1308 and 1644 identified degradation of cables due to exposure to adverse environment. What were the results of the extend of condition review? What actions have been taken or will be taken to prevent similar degradation? Are these captured in the AMP?

Assigned To: Spamer, Deb

Response:

There are no enhancements or exceptions to AMP B.1.35 as a result of operating experience discussed in Element 10.

.

These CAPs are associated with Air Ejector Offgas Radiation Monitoring cable degradation. The degradation in cable was discovered as a result of operations noticing a slow steady decline in the monitor(s)'s readout. The first CAP, O2003-1308, documented the degradation in the A channel. The second CAP, O2004-1644, documented a later occurrence of the same type of degradation in the B channel. These radiation monitoring readout degradations were suspected to have been caused by degradation of cables routed in the condenser bay, an area that experiences comparatively high radiation and high temperature conditions.

.

The radiation monitoring cables were rerouted outside of the condenser bay and its harsh environmental conditions. Radiation monitoring functions returned to normal, following cable reroutes.

.

Extent of condition for these issues extended to main steam line radiation monitoring cables. Similar fixes were implemented. (Note that main steam line radiation monitoring is included in the environmental qualification program and is not covered in B.1.35.)

.

Current routine testing of Air Ejector Offgas Radiation Monitoring is implemented via Surveillance Test 621.3.002. This testing will be continued through the period of extended operation to implement

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the NUREG-1801 XI.E2 aging management program.

No enhancements or exceptions to the GALL specified XI.E2 program are necessary to address these instances of operating experience with the air ejector offgas radiation monitoring cables.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 1/25/2006

Reviewed By: Corsi, Lou 1/25/2006

Approved By: Polaski, Fred 1/25/2006

NRC Acceptance (Date):

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Item No
AMP-220

Date Received:

Source
AMP Audit

Topic:
Number Skipped

Status:
Void

Document References:

NRC Representative

AmerGen (Took Issue):

<u>Question</u>

Assigned To: To Be Assigned

<u>Response:</u>

LRCR #:

LRA A.5 Commitment #:

IR#:

<u>Approvals:</u>

Prepared By:

Reviewed By:

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-221

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
Elec. Cables not subj. to EQ used in Instrumentation Circuit

Document References:
B.1.35

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

Are there any other cables and connections that are sensitive to reduction in IR than the ones listed in this AMP? Provide basis for the selection and applicable documents.

Assigned To: Spamer, Deb

Response:

There are no other cables and connections that are sensitive to reduction in IR and not part of the Oyster Creek environmental qualification program than the ones listed in AMP B.1.35.

The scope of systems/components/cables/connections included in this aging management program were determined by approved scoping and screening processes for Oyster Creek. Instrumentation systems were reviewed to determine which ones contained license renewal functions that are accomplished via sensitive, high voltage, low level signals and are not in the scope of Oyster Creek's environmental qualification program. This process includes review and approval by the responsible engineers at Oyster Creek. The resulting scope of Oyster Creek's XI.E2 program includes radiation and neutron monitoring systems described in the Oyster Creek LRA and program basis document PBD-AMP-B.1.35 (Air Ejector Offgas Radiation Monitoring System, Reactor Building High Radiation Monitoring System, Intermediate Range Monitoring System and Local Power Range Monitoring System).

See also AMP Audit questions AMP-155 and AMP-156 for additional discussion on high voltage, low level sensitive signal circuits.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 1/25/2006

NRC Information Request Form

Reviewed By: Corsi, Lou 1/25/2006

Approved By: Polaski, Fred 1/26/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-222

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
Inaccessible Med, Vol. Cables not subj. to EQ

Document References:
B.1.36

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

Based on several XLPE and EPR underground cable failures, what is the proposed final program for aging management of inaccessible medium voltage cables? Response to question AMP-099 stated that the white paper prepared by Amergen is currenly under review by BNE. Are the operating experience, and lessons learned to-date have been incorporated in the AMP? Provide basis and supporting documents to show that the actions that have been taken or will be taken are adequate to ensure the current licensing basis is maintained through the period of extended operation.

Assigned To: Spamer, Deb

Response:

The NUREG-1801 XI.E3 aging management program at Oyster Creek includes the underground circuits in the 2.4 kV, 4.16 kV. 13.8 kV and 34.5 kV systems at Oyster Creek. This program will test Oyster Creek's in-scope medium voltage cables to provide an indication of the condition of the conductor insulation. The specific type of test performed will be a industry endorsed, proven test for detecting deterioration of the insulation system due to wetting, such as power factor, partial discharge, or polarization index, as described in EPRI TR-103834-P1-2, or other testing that is state-of-the-art at the time the test is performed. Additionally, inspections for water collection in the manholes, conduits and sumps containing medium voltage cables within the scope of this program will be performed as a preventative measure.

.

Until industry endorsement of the chosen test methodology, Oyster Creek will continue to implement its existing medium voltage cable testing program.

.

Oyster Creek has 42 4.16 kV circuits that are currently included in the Oyster Creek medium voltage cable testing program. Past failures have been at this voltage level and are primarily attributable to manufacturing defects and water treeing type degradation. 38 of these circuits have been tested via Oyster Creek's most recent test methodology, DTE. 4 of these circuits have been tested via step voltage tests with maximum test voltages of 10 kV. Oyster Creek has 5 2.3 kV circuits that have been tested via step voltage tests that with maximum test voltages of 10 kV. A matrix of these 47 cables has been provided to the NRC audit team identifying the circuit functions, year(s) installed,

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type(s) of cable (cable insulation), reference for step voltage test and indicator if DTE testing has been completed. The type of cable currently being used for inaccessible medium voltage cable replacements is Okonite Okoguard, which is designed to water resistant criteria. These circuits date back to original operation of Oyster Creek (1969).

.

Underground circuits associated with the 13.8 kV circuits at the Forked River Combustion Turbine power plant are included in Oyster Creek's XI.E3 program. This includes circuits that feed the Oyster Creek SBO transformer and the circuits that feed the grid (via 34.5 kV switchyard). These circuits date back to the installation of Oyster Creek's alternate AC capabilities for Station Blackout (1989). Field labeling indicates that the cables feeding the grid are Cablec Unishield EP. The type of cable feeding the SBO transformer is presumed to be late 1980's vintage EPR. There have been no failures of these 13.8 kV circuits/cables. These circuits have not yet been DTE tested but are slated for addition into the existing medium voltage cable testing program.

.

Underground circuits associated with 34.5 kV circuits that provide offsite feeds to Oyster Creek are included in Oyster Creek's XI.E3 program. These circuits date back to original operation of Oyster Creek (1969). These circuits use cables manufactured by Kerite. There have been no failures of these 34.5 kV circuits/cables. These circuits have not yet been DTE tested but are slated for addition into the existing medium voltage cable testing program.

.

The electrical boundary drawing for license renewal was marked-up and provided to the NRC AMP Audit team identifying the 13.8 kV and 34.5 kV circuits included in the Oyster Creek XI.E3 aging management program.

.

Other AMP Audit questions that support the discussion on the XI.E3 program include:
- AMP-137: Location of medium voltage cables
- AMP-143: Frequency of inspection basis for XI.E3

Note: The white paper on cables was provided to BNE (New Jersey Bureau of Nuclear Engineering) for their information only. Per discussion with Roy Matthew, no further information is required on the BNE question.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 1/25/2006

Reviewed By: Corsi, Lou 1/26/2006

Approved By: Polaski, Fred 1/26/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-223

Date Received: 1/25/2006
Source AMP Audit
Status: Closed

Topic:
Inaccessible Med. Voltage Cables not subj. to EQ

Document References:
B.1.36

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

Some of the cables replaced are at the top of sand bed. Are they susceptible to wet conditions? What actions are being taken to monitor the condition of these cables on a routine basis? Provide basis for the existing frequency of inspection of cables in manholes, conduits and other inaccessible locations.

Assigned To: Spamer, Deb

Response:

The cables rerouted to the top of the sand bed are still subject to wetting by virtue of their underground location. These cables are included in the scope of the Oyster Creek XI.E3 aging management program and will be periodically tested per program elements and frequency.

Manhole, sump and vault inspection frequency follows the GALL recommended frequency for said inspections. This frequency was based on Oyster Creek specific operating experience with manholes, sumps and vaults. The Oyster Creek operating experience identified that Oyster Creek's manholes, sumps and vaults are designed such that they do not pose a wetted environment to contained circuits, i.e., they remain relatively dry. The Oyster Creek operating experience confirmed that the instances of wetted manholes were related to isolated instances of equipment failure (that resulted in plant alarms and correction of deficiencies via Oyster Creek's corrective action process). These isolated instances do not support an inspection frequency different than the GALL recommended frequency.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Spamer, Deb 1/25/2006

Reviewed By: Corsi, Lou 1/26/2006

NRC Information Request Form

Approved By: Polaski, Fred 1/26/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-224

Date Received: 1/25/2006

Source AMP Audit

Status: Accepted by NRC

Topic:
Inaccessible Med. Voltage Cables not subj. to EQ

Document References:
B.1.36

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

Element # 5 - Confirm whether the test results are trended to provide additional information regarding cable degradation.

Assigned To: Spamer, Deb

Response:

Commitment to a specific testing methodology has not yet been made since Oyster Creek is pursuing, but has not yet obtained, industry endorsement of a preferred methodology. On-going test results from the current Oyster Creek medium voltage cable testing program are being trended. Trending of test results will continue through the period of extended operation.

.

The PBD for the B.1.36 aging management program will be revised via LRCR to add trending of test results through the period of extended operation.

LRCR #: 258 *LRA A.5 Commitment #:* 36

IR#:

Approvals:

Prepared By: Spamer, Deb 1/27/2006

Reviewed By: Corsi, Lou 1/27/2006

Approved By: Polaski, Fred 1/27/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-225

Date Received: 1/25/2006
Source AMP Audit

Topic:
Inaccessible Med. Voltage Cables not subj. to EQ

Status: Closed

Document References:
B.1.36

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

Is the cable high potential test methodology changed to prevent potential damages to the cable ?

Assigned To: Spamer, Deb

Response:

The recent industry concern with high potential testing methodologies is not a concern for Oyster Creek medium voltage cables. Oyster Creek cables that voltage tested are step voltage tested to 10 kV, maximum. The industry concern is with high potential testing to 25 kV.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By:	Spamer, Deb	1/25/2006
Reviewed By:	Corsi, Lou	1/26/2006
Approved By:	Polaski, Fred	1/26/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-226

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
EQ Electrical Components

Document References:
B.3.2

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

At OCNGS, do you use monitoring method to modify a component qualified life? If used, how is that done and what are the acceptance criteria?

Assigned To: May, Mike

Response:

Oyster Creek Nuclear Generating Station normally does not use monitoring to modify a component qualified life. If monitoring is used to modify a component qualified life, plant specific acceptance criteria are established based on applicable 10CFR 50.49 qualification methods and the component qualified life is modified accordingly. The bases for requalification are maintained within the component EQ binder.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Texter,William 1/27/2006

Reviewed By: May, Mike 1/27/2006

Approved By: Warfel, Don 2/ 7/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-229

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
Per. Monitoring of Combustion Turbine Power Plant Electrical

Document References:
B.1.37

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

PBD states that OCNGS program Element # 4 (Detection of aging effects) is consistent with GALL Program X1.E4 (Metal Enclosed Bus), Element # 4. However, the GALL program requires a sample of accessible bolted connections to be checked for loose connection by using thermography or by measuring connection resistance using a low range ohmmeter. Is this an exception? Provide basis for this exception.

Assigned To: Spamer, Deb

Response:

The B.1.37 AMP element # 4 is consistent with GALL Program XI.E4 (Metal Enclosed Bus) and does not require an exception.

.
The GALL Program XI.E3 element # 4, Detection of Aging Effects, has two paragraphs. The first paragraph discusses monitoring techniques for the different components of metal enclosed bus. The first sentence identifies that a sample of accessible bolted connections will be checked for loose connection via thermography or measuring of connection resistance. The second paragraph, first sentence identifies an alternative condition monitoring technique for bolted connection that are covered with heat shrink tape, sleeving, insulating boots, etc. This GALL defined alternative is visual inspection of insulation material to detect surface anomalies. These visual inspections are to be performed prior to the period of extended operation and thereafter on a five year frequency.

.
Per walkdowns of the Forked River Combustion Turbine power plant, bolted electrical connections for the Forked River Combustion Turbine phase bus are taped.

.
Therefore, the NUREG-1801, XI.E4 portion of AMP B.1.37 includes the alternate condition monitoring by visual inspection of bolted phase bus connection insulation, prior to the period of extended operation and thereafter on a 5 year frequency.

.
Implementation of a GALL proposed alternative does not constitute an excpetion to GALL.

LRCR #: ***LRA A.5 Commitment #:***

NRC Information Request Form

IR#:

Approvals:

Prepared By:	Spamer, Deb	1/26/2006
Reviewed By:	Corsi, Lou	1/26/2006
Approved By:	Polaski, Fred	1/26/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-230

Date Received: 1/25/2006
Source AMP Audit
Status: Closed

Topic:
Flow Accelerated Corrosion

Document References:
B.1.11

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

Flow Accelerated Corrosion - What is the title of SEN-199?

Assigned To: Miller, Mark

Response:

SEN-199 is Significant Event Notification titled "Feedwater Heater Shell Rupture". This SEN has been provided in response to this question.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Miller, Mark 1/26/2006

Reviewed By: Corsi, Lou 1/26/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-231

Date Received: 1/25/2006

Source AMP Audit

Topic:
Buried Pipe Inspection

Status: Closed

Document References:
B.1.26

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

Buried Pipe Inspection - Will the buried pipe be inspected within 10 years of the current period of operation? During the inspection of buried pipe in the first 10 year period after the start of the period of extended operation, will all of the different types of buried pipe be inspected, based on if the pipe is coated or bare and based on the type material used for the pipe? Will pipe inspected during opportunistic or focused inspections be conducted in areas with high probability of damage?

Assigned To: Rafferty-Czincila, Shannon

Response:

There will not be a focused inspection of buried piping within 10 years of entering the period of extended operation because other opportunistic inspection have occurred within this 10 year period. Credit is being taken for the inspections that have been performed on the ESW & SW, which have a high likelihood of corrosion problems and have a history of corrosion related problems. (Ref. TR-116)

During the inspection of buried pipe in the first 10 years after the period of extended operation all of the different types of buried pipe will not be specifically inspected. The inspection will be performed on a system with high likelihood of corrosion problems or has a history of corrosion. The inspection will be conducted via a new PM work order unless an opportunistic inspection occurs within this ten-year period.

This responses was discussed during the 8:30am breakout session on 1/25/06.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 1/25/2006

Reviewed By: Muggleston, Kevin 1/25/2006

NRC Information Request Form

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-232

Date Received: 1/25/2006
Source AMP Audit
Status: Closed

Topic:
Buried Pipe Inspection

Document References:
B.1.26

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

Buried Pipe Inspection - What specific type of material are used to constructed the buried pipe?

Assigned To: Rafferty-Czincila, Shannon

Response:

The Oyster Creek buried pipe aging management program contains aluminum, cast iron, stainless steel and bronze. All but 25 ft of the AL piping has been rerouted to an above ground location. The remaining AL buried piping is part of the Condensate Transfer system and the cast iron pipe is part of the Fire Protection system. The Heating & Process Steam and Roof Drain & Overboard discharge systems possibly contain stainless steel and bronze, respectively. The reason we say "possibly" is because Oyster Creek has never had a failure of any SS or bronze piping in either of the reference systems, however SS and bronze are approved for use in the respective systems via either an engineering change requests or a line specification. Therefore Oyster Creek has conservative included these materials in the scope of the buried pipe aging management program. The new buried pipe that has either been or will be installed in the ESW and SW systems is Carbon Steel with a Devo epoxy coating. The pipe is then wrapped with a polyken protective tape.

This responses was discussed during the 8:30am breakout session on 1/25/06.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 1/25/2006

Reviewed By: Muggleston, Kevin 1/25/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No
AMP-233

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
Met Tower Buried Pipe Inspection

Document References:
B.1.26B

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

This AMP includes an inspection of buried pipe within 10 years of the end of the current period of operation and another during the first 10 years of extended operation. Do these inspections include inspection of bare and coated piping. The discussion states that the most susceptible areas will be inspected. It also states that inspections may occur when the pipe is uncovered for other purposes. This may not be a susceptible area. Will additional inspections be conducted in susceptible areas?

Assigned To: Muggleston, Kevin

Response:

The piping in the scope of this program includes coated carbon steel piping and also copper piping. It is not known if the copper piping is coated below ground. At this time there is no evidence that any location is more susceptible than any other location. No buried piping inspections have been performed to date. As stated in the Program Basis Document PBD-AMP-B.1.26B, the results of any inspections will be used to identify susceptible locations for future inspections. If susceptible locations are identified, they will be inspected at the next required inspection.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/ 2/2006

Reviewed By: Miller, Mark 2/ 3/2006

Approved By: Warfel, Don 2/ 3/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-234

Date Received: 1/25/2006

Source
AMP Audit

Status: Accepted by NRC

Topic:
Structures Monitoring Program

Document References:
B.1.31

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

Both B.1.30 and B.1.32 are actually conducted under the OCGS Strucutures Monitoring Program, which is described in B.1.31. The program requirements and commitments contained in AMPs B.1.30 and B.1.32 should be included in AMP B.1.31 by reference, for completeness. Please address how this is implemented in B.1.31.

Assigned To: Ouaou, Ahmed

Response:

As stated in the Program Description for the B.1.31 Structures Monitoring Program in Appendix B of the OC LRA, "The scope of the program also includes condition monitoring of masonry walls and water-control structures as described in the Masonry Wall Program and in the RG 1.27, Inspection of Water-Control Structures Associated With Nuclear Power Plants, aging management program." It is noted in the Conclusion sections for both the B.1.30 Masonry Wall Program and the B.1.32 RG 1.127, Inspection of Water-Control Structures Associated With Nuclear Power Plants, the program "is part of the Structures Monitoring Program."

Although these relationships can be inferred from the text in PBD-AMP-B.1.31 (and PBD-AMP-B.1.30 and AMP-AMP-B.1.32) similar clear references (PBD identifying numbers) are not included. PBD-AMP-B.1.31 (and PBD-AMP-B.1.30 and AMP-AMP-B.1.32) will be revised to clearly indicate that both the B.1.30 Masonry Wall Program and the B.1.32 RG 1.27, Inspection of Water-Control Structures Associated With Nuclear Power Plants, aging management programs are conducted under the B.1.31 Structures Monitoring Program. Appropriate references will also be included.

LRCR #: 253 *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Beck, George 1/26/2006

NRC Information Request Form

Reviewed By: Ouaou, Ahmed 1/26/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date): 1/27/2006

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-235		1/25/2006	AMP Audit
Topic:		***Status:***	Accepted by NRC
Structures Monitoring Program			

Document References:
B.1.31

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

In response to staff RAI 2.5.1.15-1, OCGS has committed to additional enhancements to B.1.31. These additional commitments are not addressed in the PBD for B.1.31. How will these additional commitments be incorporated into B.1.31? Will this include specific guidance for inspection of the meteorological tower, which is a unique structure?

Assigned To: Ouaou, Ahmed

Response:

PBD-AMP-B.1.31 will be revised to add Meteorological Structures and Radio Communications Systems piping and component external surfaces based on RAI 2.5.1.15-1 response. The PBD will include meteorological tower, guy wires, foundations, supports, and other structures identified in scope of license renewal in accordance with response to RAI 2.5.1.15-1. Inspection and acceptance criteria will be consistent with those applied to Oyster Creek structures. Inspection of the meteorological tower will utilize binoculars, or other remote inspection tools, for upper region of the towers consistent with the inspection practice for ventilation stack.

LRCR #: 224 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Beck, George	1/26/2006
Reviewed By:	Ouaou, Ahmed	1/26/2006
Approved By:	Warfel, Don	1/30/2006

NRC Acceptance (Date): 1/27/2006

NRC Information Request Form

Item No
AMP-262

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
Fuel Oil Chemistry

Document References:
B.1.22

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

AMP-TBD (Audit2 B.1.22-15): The Program Basis Document for AMP B.1.22 (PBD-AMP-B.1.22) states that the existing program will be enhanced to include draining, cleaning, and inspection of the main fuel oil storage tank and the fire pond diesel fuel oil tanks. Please state when the first draining, cleaning, and inspection of these tanks will be performed.

Assigned To: Miller, Mark

Response:

The following tasks for draining, cleaning, and internally inspecting the fire pond diesel fuel oil tanks are in the Oyster Creek work management process:
R2060569/PM81106M for T-9-103. This activity will be performed prior to the period of extended operation.
R2060570/PM81107M for T-9-104. This activity will be performed prior to the period of extended operation.

The task for draining, cleaning, and internally inspecting the Main Fuel Oil Tank has not been entered into the Oyster Creek work management process yet. This activity will be performed prior to the period of extended operation.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Miller, Mark 1/26/2006

Reviewed By: Getz, Stu 1/26/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No
AMP-263

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
One Time Inspection

Document References:
B.1.24

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

AMP-TBD (Audit2 B.1.24-7): The OCGS Inspection Sample Basis document for the one-time inspection, dated 08/16/2005, provides the rational for selecting sample populations for this AMP. This document is cited in the Program Basis Document for this AMP (PBD-AMP-B.1.24) numerous times; however it is not part of the program basis document, nor does it appear to be a controlled document since there is no document number assigned to it and there are no approval signatures on it. A review of this document shows that it contains errors, such as references to the draft January 2005 version of GALL that are no longer applicable to the approved September 2005 GALL. For example, in section A, reference is made to GALL line item IV.C1-2 (R-55); however, this line item is no longer included in the approved September 2005 version of GALL In addition, changes to this document could result in a modified sample selection process that is no longer consistent with the recommendations in the GALL report. Please provide the following information:
a) Discuss the administrative controls that will be used to update and control this document to ensure that the sample selection process remains consistent with the recommendations in the approved September 2005 GALL report; and
b) Explain why the contents of this document are not included directly into the Program Basis Document for this AMP.

Assigned To: Miller, Mark

Response:

The "Inspection Sample Basis, Oyster Creek License Renewal Project" document will be converted into a controlled project Position Paper with associated review and approval signatures. The new Position Paper will be referenced in the Program Basis Document PBD-AMP-B.1.24. Reconciliation between the draft January version of GALL and the issued September revision 1 of GALL is addressed in a separate reconciliation provided in the response to AMP-153.

LRCR #: 259 ***LRA A.5 Commitment #:***

IR#:

NRC Information Request Form

Approvals:

Prepared By:	Muggleston, Kevin	1/27/2006
Reviewed By:	Micklo, Charles	1/27/2006
Approved By:	Warfel, Don	1/30/2006
NRC Acceptance (Date):		

NRC Information Request Form

Item No
AMP-264

Date Received: 1/25/2006

Source AMP Audit

Status: Open

Topic:
One Time Inspection

Document References:
B.1.24

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

AMP-TBD (Audit2 B.1.24-8): The OCGS Inspection Sample Basis document for the one-time inspection, dated 08/16/2005, states in Section A that the one-time inspection sample size will include 10% of the total butt welds in Class 1 piping under 4", and the actual inspection locations will be based on physical accessibility, exposure levels, NDE techniques, etc. and will be determined by the site. Please provide the following information:
a) How will the sample selection process ensure that samples of all different pipe sizes less than 4" are inspected (i.e., 1", 2", 3" etc.)?
b) Are there any Class 1 pipes less than 4" NPS in the scope of this AMP that are not butt welded (e.g., socket welded)? If so, how will these non-butt welded pipes be inspected since UT examination is not suitable for socket welds?
c) What is Oyster Creek's operating experience with Class 1 piping less than 4 inch NPS in terms of cracking?

Assigned To: Miller, Mark

Response:

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:

Reviewed By:

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-265

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
One Time Inspection

Document References:
B.1.24

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

<u>Question</u>

AMP-TBD (Audit2 B.1.24-9): The OCGS Inspection Sample Basis document for the one-time inspection, dated 08/16/2005, states that the one-time inspection sample size for stress corrosion cracking will include one (1) stainless steel pipe section in a stagnant or low flow area (>140F). The sample size for loss of material includes 2 carbon steel pipe sections in some cases, and 3 carbon steel pipe sections in other cases. Please provide the rational and justification for selecting the number of samples for each aging effect. In particular, discuss why one sample of stainless steel piping is considered to be an adequate population for detecting stress corrosion cracking. Include a discussion of how Oyster Creek operating experience was factored into the number of samples selected for each application.

Assigned To: Miller, Mark

<u>Response:</u>

The OCGS Inspection Sample Basis document for the one-time inspection, dated 08/16/2005, states that the one-time inspection program will be used to verify the effectiveness of the Water Chemistry program to manage stress corrosion cracking. The one-time inspection program sample size for stress corrosion cracking will include one (1) stainless steel pipe section in a stagnant or low flow area (>140F). The selected sample for one-time inspections for stress corrosion cracking currently includes:

·One (1) stainless steel pipe section in a stagnant or low flow area (> 140 F) in the Reactor Water Cleanup System. The one-time inspection for cracking will be by nondestructive examination (UT). Examples of acceptable sample locations include:

-Cleanup Aux. Pump discharge line between V-16-13 and the 6" RWCU main process line.

·One (1) stainless steel pipe section in a stagnant or low flow area (> 140 F) in the Isolation Condenser System. The one-time inspection for cracking will be by nondestructive examination (UT). Examples of acceptable sample locations include:

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-12" or 16" non-class 1 Isolation Condenser steam inlet piping. Portions of the 8" or 10" condensate return lines up to the normally closed isolation condenser condensate return valves can also be inspected if > 140 F.

The selected sample for one-time inspections for stress corrosion cracking will be revised as follows:

·Two (2) stainless steel pipe sections in a stagnant or low flow area (> 140 F) in the Reactor Water Cleanup System. The one-time inspection for cracking will be by nondestructive examination (UT). Examples of acceptable sample locations include:

-Cleanup Aux. Pump discharge line between V-16-13 and the 6" RWCU main process line.

·Two (2) stainless steel pipe sections in a stagnant or low flow area (> 140 F) in the Isolation Condenser System. The one-time inspection for cracking will be by nondestructive examination (UT). Examples of acceptable sample locations include:

-12" or 16" non-class 1 Isolation Condenser steam inlet piping. Portions of the 8" or 10" condensate return lines up to the normally closed isolation condenser condensate return valves can also be inspected if > 140 F.

The one-time inspections performed for the non-class 1 portions of the Isolation Condenser System to verify the effectiveness of the water chemistry program to manage cracking are different inspections from those inspections performed in conjunction with ASME Sections XI, Water Chemistry, and the BWR Stress Corrosion Cracking aging management programs for RCPB piping, piping components, and piping elements. The one-time inspections specified for the non-RCPB portions of the Reactor Water Cleanup System are inspections beyond thoses required by the BWR Reactor Water Cleanup System aging management program.

LRCR# 259 will track changes associated with this question. It is noted that LRCR# 259 will also be used to convert the "Inspection Sample Basis, Oyster Creek License Renewal Project" document into a controlled project Position Paper with associated review and approval signatures (reference AMP-263).

LRCR #: 259 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 1/31/2006

Reviewed By: Muggleston, Kevin 2/10/2006

Approved By: Warfel, Don 2/10/2006

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No
AMP-266

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
One Time Inspection

Document References:
B.1.24

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

AMP-TBD (Audit2 B.1.24-10): The third exception for OCGS AMP B.1.24 states that EPRI Report 1000701 is not applicable to Oyster Creek since it was developed for PWR plants. While locations specific to PWR plants are focused on in this document, generic guidance on locations to examine and inspection methods to use for detecting thermal fatigue are also provided in this document that may be useful for BWR plants. Please clarify why this document is not applicable for the generic guidance provided.

Assigned To: Miller, Mark

Response:

The Oyster Creek evaluation to identify piping potentially susceptible to the effects of thermal fatigue is provided in Program Basis Document PBD-AMP-B.1.24, Section 3.1, page 15. This evaluation addresses the generic guidance of the EPRI document for identification of locations. No locations were identified as requiring inspection.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 1/27/2006

Reviewed By: Micklo, Charles 1/27/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-267

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
Overhead Heavy Load & Light Load related to Refueling

Document References:
B.1.16

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

INSPECTION OF OVERHEAD HEAVY LOAD AND LIGHT LOAD (RELATED TO REFUELING) HANDLING SYSTEMS
AMP-TBD (Audit2 B.1.16-4): The Program Basis Document for AMP B.1.16 (PBD-AMP-B.1.16, Rev.0) states, in Section 2.4, that the existing program will be enhanced to include 1) visual inspection of structural members for loss of material due to general corrosion, and 2) visual inspection of rails for loss of material due to wear. This enhancement implies that these activities are currently not included in the existing program. However, the discussion of operating experience in Section 3.10 of the PBD states that experience at Oyster Creek shows the existing program is effective in managing general corrosion on structural components, and wear on the rails for the cranes and trolleys. In addition, the FSAR supplement in Section A.1.16 of the OCGS LRA states that crane and hoist structural components, including the bridge, the trolley, bolting, lifting devices, and the rail system are visually inspected periodically for loss of material. Based upon the aforementioned statements, it appears that the stated enhancement addresses activities that are already performed. Please clarify specifically what aging management activities are included in the existing program, and what the enhancement will add to the existing program.

Assigned To: Muggleston, Kevin

Response:

The existing program has been effective in managing general corrosion on structural components, and wear on the rails for cranes and trolleys. However, the implementing procedures do not explicitly identify steps to inspect for these aging mechanisms. Therefore, as stated in the LRA Appendix B.1.16, the program is enhanced to provide for specific inspections for rail wear, and for corrosion of cranes and hoists structural components.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Muggleston, Kevin	1/26/2006
Reviewed By:	Ouaou, Ahmed	1/26/2006
Approved By:	Warfel, Don	1/30/2006
NRC Acceptance (Date):		

NRC Information Request Form

Item No
AMP-268

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
One Time Inspection-FRCT

Document References:
B.1.24A

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

AMP-TBD (Audit2 B.1.24A-1): The description of the "parameters monitored/inspected" AMP element states that inspection methods consist of nondestructive examination, including visual, volumetric, and surface techniques. Since OCGS AMP B.1.24.A is not based upon the requirements of the ASME Code, please describe the rational to be used in selecting the inspection method for the various types of components in the scope of this AMP.

Assigned To: Muggleston, Kevin

Response:

This aging management program performs one-time inspections to confirm the effectiveness of the Fuel Oil Chemistry - FRCT and Lubricating Oil Analysis Program - FRCT. The inspection method selected will depend on the component type, intended function, material and aging effect. Heat transfer surfaces of components with a heat transfer intended function will be inspected using visual inspection to identify fouling or other surface degradation that could impair the heat transfer function. This same visual inspection also assures that the pressure boundary intended function is maintained. The stainless steel filter element with a filter intended function will also be inspected using visual techniques to identify accumulations of dirt or sediment, or degradation of the filter element that could impair or reduce the effectiveness of the filter intended function. Similarly, restricting orifices will be inspected using visual techniques to identify degradation of the orifice that could impair or reduce the effectiveness of the throttle intended function. This same visual inspection also assures that the pressure boundary intended function is maintained.

The remaining mechanical components in the scope of this program have a pressure boundary intended function and are subject to loss of material aging effect. Mechanical components will be inspected using visual or ultrasonic techniques in order to determine the extent of loss of material by evaluating the extent of loss of wall thickness. The technique selected will depend on the component type, and whether the inspection involves disassembly or is performed without disassembly. For combustion turbine components, the most appropriate technique will be determined based on manufacturers experience and recommendations for the component. Piping can be inspected for

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wall thickness using ultrasonic techniques. Visual inspection techniques are appropriate for pump casings, strainer bodies, filter housings and valve bodies when disassembled during maintenance activities. The above described component inspections will confirm the effectiveness of the Fuel Oil Chemistry - FRCT and Lubricating Oil Analysis Program - FRCT.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 1/26/2006

Reviewed By: Miller, Mark 1/26/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-269

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
One Time Inspection FRCT

Document References:
B.1.24A

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

AMP-TBD (Audit2 B.1.24A-2): The description of the "detection of aging effects" AMP element discusses sample selection for this AMP. Please clarify whether the OCGS document "Inspection Sample Basis, Oyster Creek License Renewal Project" that was developed for AMP B.1.24 One-Time Inspection will also be used for this AMP. If not, please describe the rational that will be used to determine sample population and location, and the process for evaluating results and determining corrective actions.

Assigned To: Muggleston, Kevin

Response:

The component sample inspection requirements for the Forked River Combustion Turbine components in the scope of the B.1.24A One-Time Inspection - FRCT program will be determined based on an evaluation of operating experience with these units and similar General Electric combustion turbine units that have been in service for many years. The manufacturer and power industry users have developed maintenance and inspection plans designed to attain high operational reliability over time. The most appropriate sample size and inspection locations will be determined based on this experience and manufacturers recommendations.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 1/26/2006

Reviewed By: Miller, Mark 1/26/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No
AMP-270

Date Received: 1/25/2006

Source
AMP Audit

Status: Closed

Topic:
One Time Inspection FRCT

Document References:
B.1.24A

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

AMP-TBD (Audit2 B.1.24A-4): The Program Basis Document for this AMP (PBD-AMP-B.1.24A, Rev.0) states in the first exception that the ASME requirements are not applicable and AmerGen has elected not to include the Forked River combustion turbine one-time inspection under 10 CFR 50, Appendix B requirements. Further, the Forked River combustion turbine one-time inspection will be conducted under a separate quality assurance activity specifically developed for Forked River combustion turbines. Please provide the following information related to the quality assurance program to be developed for Forked River combustion turbines :
a) Discuss how the Forked River combustion turbine quality assurance procedures will be documented,
b) Identify areas for which the Forked River combustion turbine quality assurance activities will not be equivalent to 10 CFR 50, Appendix B
c) Discuss the administrative controls to be implemented for the quality assurance procedures,
d) Discuss the current status of the quality assurance procedures, and
e) Explain the process that will be followed to obtain NRC approval of these quality assurance procedures

Assigned To: Muggleston, Kevin

Response:

a) Requirements for corrective actions, confirmation and administrative control of activities, processes and procedures associated with FRCT aging management programs will be appropriately documented to assure consistent and verifiable implementation.

b) The FRCT quality assurance activities associated with implementation of the aging management programs will be in accordance with NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants," revision 1, Appendix A.1 and A.2.

c) As stated in the FRCT Program Basis Documents, the Forked River Combustion Turbine procedures will include administrative controls that provide for formal review and approval of aging

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management activities.

d) Procedures associated with quality assurance for the FRCT aging management program activities have not been prepared. The requirements to establish appropriate procedures as described in the FRCT Program Basis Documents are included in the commitment tracking system.

e) Procedures associated with implementation of the FRCT aging management program activities are subject to NRC audit and inspection following implementation prior to entering the period of extended operation.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Muggleston, Kevin 1/26/2006

Reviewed By: Miller, Mark 1/26/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-271

Date Received: 1/25/2006

Source AMP Audit

Topic:
Fuel Oil Chemistry FRCT

Status: Closed

Document References:
B.1.22A

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

AMP-TBD (Audit2 B.1.22A-2): The description of "detection of aging effects" AMP element states that, based on the results of the October 2000 inspections and repairs, the tank was certified to be suitable for the storage of number 2 fuel oil for a period of time not to exceed 20 years from October 2000, before the next internal inspection would be necessary. Please provide the technical basis for establishing the 20-year inspection interval and discuss why a 20-year inspection frequency is acceptable for this tank while the main fuel oil storage tank at the Oyster Creek plant is inspected every 10 years.

Assigned To: Micklo, Charles

Response:

The Forked River fuel oil tank was inspected, repaired with a material allowance for corrosion and certified for an additional 20 years of service before requiring internal reinspection. The out-of-service inspection was consistent with the requirements of API-653 and NJAC 7:1E-2.2(a)4. Refer to TAQ Inc. certification, dated October 30, 2000 included as attachment 4.3.2 of PBD-B.1.22A. The certification requires inservice inspections conducted at 5 year intervals and operation and maintenance consistent with industry standards.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Micklo, Charles 1/26/2006

Reviewed By: Miller, Mark 1/26/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-272

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
Fuel Oil Chemistry FRCT

Document References:
B.1.22A

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

<u>Question</u>

AMP-TBD (Audit2 B.1.22A-3): The description of the "monitoring and trending" AMP element states that in the event the acceptance criteria for stored fuel oil are exceeded, corrective actions will be initiated. Since there are no technical specifications for the Forked River Combustion Turbine, please identify the specifications that will be used to determine if the fuel oil sampling results are acceptable.

Assigned To: Micklo, Charles

<u>Response:</u>

Water and sediment concentrations are tested in accordance with ASTM Standards D 1796 or D 2709. Particulate contamination is determined by use of modified ASTM Standard D 2276 Method A or ASTM Standard D 6217. Acceptance criteria is per ASTM D 975.
Use of ASTM D 975 is consistent with General Electric Specification GEI-41047H for the Forked River Combustion Turbines.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By:	Micklo, Charles	1/26/2006
Reviewed By:	Miller, Mark	1/26/2006
Approved By:	Warfel, Don	1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-273

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
Fuel Oil Chemistry FRCT

Document References:
B.1.22A

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

AMP-TBD (Audit2 B.1.22A-4): The first exception to NUREG-1801 in OCGS AMP B.1.22A states that multilevel sampling and tank bottom sampling of the diesel starter engines fuel oil tanks is not performed. Also, periodic draining of water and sediment from the bottom of these tanks is not required, and the cleaning and internal inspection of these tanks is not necessary. Please provide the following information with regard to this exception:
a) Clarify whether the capability exists to perform multilevel and tank bottom sampling of these tanks.
b) Explain what the turnover rate is for the diesel starter engines fuel oil tanks, and the technical basis for concluding that stratification of the fuel in these tanks will not occur.
c) Discuss the operating experience with water concentration and sediment buildup in the combustion turbine fuel oil storage tank that supplies the diesel starter engines fuel oil tanks.
d) Provide the technical justification for not performing a one-time inspection to confirm that aging degradation is not a concern for these tanks

Assigned To: Muggleston, Kevin

Response:

a) The FRCT diesel starter engines diesel fuel oil tanks are small tanks built into each of the combustion turbine accessory skids. These tanks do not have the capability for multilevel or tank bottom sampling without disassembling tank piping connections.

b) The FRCT units are commercially operated units, used to supply peak power to the grid. As such, they are frequently started and stopped, requiring frequent starting and running of the starting diesel engine. The diesel engine runs for approximately 20 minutes each time the associated turbine is started. The tank level is checked regularly during operator rounds, and the tanks are filled manually from the turbine fuel oil header when required. The tanks require filling approximately once every month on average, more frequently during high usage months and less frequently during low usage months depending on seasonal grid load. Since the diesel engines are routinely operated, the fuel tanks are regularly drawn down and periodically refilled, precluding fuel stratification. The enclosure where the tank is located is maintained at a constant temperature during cold periods by operation of

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enclosure heaters.

c) The fuel oil storage tank that supplies the diesel engine fuel tanks was drained and an internal inspection was performed in October 2000. No evidence of water accumulation was found in the tank. The tank floor includes a sump pit designed to collect any water. The sump pit was found to be in good condition, with no visible corrosion, indicating that the tank has not experienced significant water accumulation or sediment buildup. Over the entire surface of the floor, 15 corrosion pits were found, with the deepest pit measuring 0.060" deep measured with a pit gauge. These pits were subsequently weld repaired.

The tank design includes a floating roof that precludes atmospheric moisture intrusion into the oil. Water was not ever drained from the tank bottom prior to the tank inspection. Since the internal inspection did not reveal significant water accumulation, there is no need to periodically drain the tank bottom.

d) One-time inspections will be performed on a number of components in the fuel oil supply system, to confirm the effectiveness of the Fuel Oil Chemistry - FRCT aging management program. An effective fuel oil chemistry program will preclude aging degradation of the diesel engine supply tanks without the need to disassemble and inspect the tanks. If the results of one-time inspections indicate that fuel oil chemistry controls have been ineffective, corrective actions will be implemented including evaluation and/or inspection of additional system components potentially affected, including the diesel fuel tanks.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 1/26/2006

Reviewed By: Miller, Mark 1/26/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-274		1/25/2006	AMP Audit
Topic:		***Status:***	Closed
Fuel Oil Chemistry FRCT			

Document References:
B.1.22A

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

AMP-TBD (Audit2 B.1.22A-5): The Program Basis Document for this AMP (PBD-AMP-B.1.22A, Rev.0) states in the third exception that the corrective actions, confirmation process, and administrative controls elements of this AMP are not accomplished in accordance with the requirements of 10 CFR 50, Appendix B. Please provide the following information related to the quality assurance program to be developed for Forked River combustion turbines:
a) Discuss how the Forked River combustion turbine quality assurance procedures will be documented,
b) Identify areas for which the Forked River combustion turbine quality assurance activities will not be equivalent to 10 CFR 50, Appendix B
c) Discuss the administrative controls to be implemented for the quality assurance procedures,
d) Discuss the current status of the quality assurance procedures, and
e) Explain the process that will be followed to obtain NRC approval of these quality assurance procedures

Assigned To: Muggleston, Kevin

Response:

a) Requirements for corrective actions, confirmation and administrative control of activities, processes and procedures associated with FRCT aging management programs will be appropriately documented to assure consistent and verifiable implementation.

b) The FRCT quality assurance activities associated with implementation of the aging management programs will be in accordance with NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants," revision 1, Appendix A.1 and A.2.

c) As stated in the FRCT Program Basis Documents, the Forked River Combustion Turbine procedures will include administrative controls that provide for formal review and approval of aging management activities.

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d) Procedures associated with quality assurance for the FRCT aging management program activities have not been prepared. The requirements to establish appropriate procedures as described in the FRCT Program Basis Documents are included in the commitment tracking system.

e) Procedures associated with implementation of the FRCT aging management program activities are subject to NRC audit and inspection following implementation prior to entering the period of extended operation.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 1/26/2006

Reviewed By: Miller, Mark 1/26/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-275

Date Received: 1/25/2006

Source AMP Audit

Status: Closed

Topic:
Inspection of Internal Surfacs in Misc Piping & Ducting Comp

Document References:
B.1.38

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

AMP B.1.38 Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components - FRCT AMP-TBD (Audit2 B.1.38-1): Please clarify whether any elastomeric materials, such as flexible ducting and seals, are used in the Forked River combustion turbine systems included in the scope of license renewal, and whether they will be inspected as part of this program.

Assigned To: Micklo, Charles

Response:

There are 2 elastomeric components used in the Forked River combustion turbine mechanical systems subject to aging management. They are expansion joints and flexible connections exposed to fuel oil, outdoor air and indoor air. NUREG-1801 line item VII.F4-6 (A-17) for elastomer seals and components exposed to an indoor air environment was used for the duct expansion joint. It calls for a plant specific aging management system. The plant specific aging management system used for inspection of these components is the Forked River Periodic Inspection program.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Micklo, Charles 1/26/2006

Reviewed By: Muggleston, Kevin 1/26/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMP-276		1/25/2006	AMP Audit
Topic:		***Status:***	Closed

FW Nozzle New

Document References:

B.1.05

NRC Representative Subudhi, Mano

AmerGen (Took Issue):

Question

The FW nozzle inspection is included in the Oyster Creek ISI program plan under Category B-D, "Full Penetration Welds of Nozzles in Vessels," consistent with the requirements of Table IWB 2500-1. In accordance with NUREG-0619, "BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle," augmented PT examinations are to be performed for the feedwater nozzles. In 1994, OCGS requested and was granted relief to eliminate periodic PT examination of the nozzle blend radius area, and to utilize the most advanced UT method available at the time.

The UT techniques specified in GE NE-523-A71-0594-A are currently identified as acceptable in GALL AMP XI.M5, and are credited in PBD for OCGS AMP B.1.05.

Review of OCGS OC-1 Program Plan which includes feedwater nozzle inspection, does not identify implementation of the use of the UT techniques specified in GE NE-523-A71-0594-A applicable to FW nozzles.

(a) Please confirm that periodic FW nozzle inspections will be performed using UT techniques specified in GE NE-523-A71-0594-A and address the process that will incorporate this requirement into the OCGS OC-1 Program Plan.

(b) Since relief requests remain effective during the 10-year period for Section XI examination in effect now, how this relief request will remain effective during the period of extended operation.

Assigned To: May, Mike

Response:

a) As stated in the program basis document PBD-AMP-B.05, the Oyster Creek Feedwater Nozzle aging management program will be enhanced to implement the recommendations of the BWR Owners Group Topical Report, GE NE-523-A71-0594-A. OC-1 will be revised to state periodic FW nozzle inspections will be performed using UT techniques specified in GE NE-523-A71-0594-A. This change is tracked and implemented through the OCLR commitment tracking system as item 00330592.05.03.

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b) The approval granted by the NRC in 1992 to inspect the Feedwater Nozzle using UT in lieu of PT examination methodology has no time limit. This approval was not a relief to the ISI program in accordance with 10 CFR 50.55a and therefore does not expire with the 10-year ISI interval.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: May, Mike 1/27/2006

Reviewed By: Getz, Stu 1/27/2006

Approved By: Warfel, Don 2/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-277

Date Received:

Source
Other

Status: Void

Topic:
Number skipped!

Document References:

NRC Representative

AmerGen (Took Issue):

<u>Question</u>

Assigned To: To Be Assigned

<u>Response:</u>

LRCR #:

LRA A.5 Commitment #:

IR#:

<u>Approvals:</u>

Prepared By:

Reviewed By:

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-278

Date Received: 1/25/2006

Source AMP Audit

Status: Void

Topic:
See 197

Document References:
B.1.07

NRC Representative Subudhi, Mano

AmerGen (Took Issue):

Question

(a) GALL requires the carbon content and ferrite content screening criteria, as stated in the GL 88-01, to be applied to both component and weld materials, including CASS.
The PBD (pg. 11 of 27) indicates that OCGS is currently applying these criteria to new and replacement components and weld materials. However, the OCGS PBD adds a new enhancement to apply the screening criteria to all new and replacement SS components in order to be consistent with GALL. Please explain why this enhancement is needed when OCGS has already been using the same criteria since the issuance of the GL 88-01.

(b) The OCGS LRA description for the BWR Stress Corrosion Cracking program (AMP B.1.7) does not include any enhancements. Please discuss how the new enhancement discussed above will be documented as part of the LRA.

Assigned To: Rafferty-Czincila, Shannon

Response:

This is a repeat of AMP-197. (SBR 1/25/06)

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 1/25/2006

Reviewed By:

Approved By: Warfel, Don 1/31/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-279

Date Received: 1/25/2006

Source AMP Audit

Status: Void

Topic:
Same as 198

Document References:
B.1.08

NRC Representative Subudhi, Mano

AmerGen (Took Issue):

Question

The OCGS LRA descriptions for the BWR SCC program (AMP B.1.07) and BWR Penetrations program (AMP B.1.08) include the same exception to GALL with regard to the use of BWRVIP-29. The PBD for the AMP-B.1.07 deleted this exception as discussed in the reconciliation document. However, the exception for the AMP B.1.08 has not been deleted from the LRA and it is not mentioned in the reconciliation document. Please explain the rational for how this exception is applied.

Assigned To: May, Mike

Response:

This a dupilcate to question AMP-198. See response to AMP-198 for closure.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: May, Mike 1/26/2006

Reviewed By: Getz, Stu 1/26/2006

Approved By: Warfel, Don 1/31/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-280

Date Received: 1/25/2006

Source AMP Audit

Topic:
BWR SCC Revised

Status: Void

Document References:
B.1.07

NRC Representative

AmerGen (Took Issue):

Question

(a) GALL requires the carbon content and ferrite content screening criteria, as stated in the GL 88-01, to be applied to both component and weld materials, including CASS.
The PBD (pg. 11 of 27) indicates that OCGS is currently applying these criteria to new and replacement components and weld materials. However, the OCGS PBD adds a new enhancement to apply the screening criteria to all new and replacement SS components in order to be consistent with GALL. Please explain why this enhancement is needed when OCGS has already been using the same criteria since the issuance of the GL 88-01.

(b) The OCGS LRA description for the BWR Stress Corrosion Cracking program (AMP B.1.7) does not include any enhancements. Please discuss how the new enhancement discussed above will be documented as part of the LRA.

Assigned To: Rafferty-Czincila, Shannon

Response:

This is a repeat of AMP-197. (SBR 1/31/06)

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 1/31/2006

Reviewed By: N/A

Approved By: Warfel, Don 1/31/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-281

Date Received: 1/26/2006

Source AMP Audit

Topic:
Underground Piping FRCT & MET Tower

Status: Closed

Document References:

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

After the underground piping for the FRCT and Met. Tower is inspected, describe your corrective action program if problems similar to the ESW are encountered, given that these are not Appendix B systems?

Assigned To: Muggleston, Kevin

Response:

As described in section 3.7 of program basis documents PBD-AMP-B.1.26A "Buried Piping Inspection - FRCT" and PBD-AMP-B.1.26B "Met Tower Repeater Engine Fuel Supply (MTREFS) Buried Piping Inspection," processes and procedures will be established to assure that conditions adverse to quality are promptly identified and corrected. Identified conditions that do not satisfy acceptance criteria will be documented, evaluated, and corrected as required to maintain the intended functions during the period of extended operation.

The following was added on 2/13/2006 to identify the associated commitment tracking item:

The commitment to prepare implementing procedures for aging management program B.1.26A "Buried Piping Inspection - FRCT" is tracked by Commitment Tracking item 330592.64. The commitment to prepare implementing procedures for aging management program B.1.26B "Met Tower Repeater Engine Fuel Supply (MTREFS) Buried Piping Inspection," is tracked by Commitment Tracking item 330592.68.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/13/2006

NRC Information Request Form

Reviewed By:	Micklo, Charles	2/13/2006
Approved By:	Warfel, Don	2/13/2006
NRC Acceptance (Date):		

NRC Information Request Form

Item No
AMP-282

Date Received: 1/27/2006

Source AMP Audit

Status: Closed

Topic:
Forked River Combustion Turbine

Document References:
B.1.14A

NRC Representative Villaran, Mike

AmerGen (Took Issue):

Question

Exception #1 in Section 2.2 on page 7 of 24 to PBD-AMP-B.1.14A is similar to the exception taken for PBD-AMP-B.1.14 for the in-plant closed cycle cooling water system. (See Questionand Response Item No. AMP-080)

The Applicant takes an exception for the use of the 2004 document EPRI TR-107820, which is Revision 1 to the 1997 EPRI TR-7396, in Section 2.2 on page 7 of 24 to PBD-AMP-B.1.14A. However, this exception is not taken for any of the 10 program elements in the discussions of the individua program elements within PBD-AMP-B.1.14A, Have these paragraphs been inadertently omitted from the document?

Assigned To: Muggleston, Kevin

Response:

Program Basis Document PBD-AMP-B.1.14A will be revised to include this exception in elements 2, 3, 5 and 6.

LRCR #: 257 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 1/27/2006

Reviewed By: Getz, Stu 1/27/2006

Approved By: Warfel, Don 1/27/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No	*Date Received:*	*Source*
AMP-336	2/13/2006	AMP Audit
Topic:	*Status:*	Closed

Document References:

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

Based on OCGS operating experience, one of the contributing causes of cable failures was moisture intrusion, the existing frequency of 2 years for inspection of cables as stated in the LRA is not consistent with GALL recommendation, considering the operating experience. Provide justification why OCGS do not have to increase the frequency of inspection.

Assigned To: Spamer, Deb

Response:

The Oyster Creek LRA B.1.36 aging management program inspection frequency for manholes, sumps and vaults is every two years. This preventative action inspection frequency is based on the specifics of Oyster Creek's operating experience with standing water in manholes and causes of medium voltage cable failures as well as other conservatisms in Oyster Creek's new aging management program for inaccessible medium voltage cables.

.

When performing OE searches, it was determined that very few recent (within the last 5 years) corrective action or corrective maintenance process items exist for water collection in Oyster Creek manholes, sumps and vaults. Without repeat occurrences or a common cause evaluation for what is perceived to be a repetitive issue, this lack of OE for water collection is an indication that water collection in Oyster Creek manholes, sumps and vaults has not been a common, repetitive occurrence. Previous problems with water in the intake structure manhole have been resolved by physical improvements (seals) and the dilution structure vault has a sump, a sump pump and a control room level alarm for water. Note that GE Vulkene cable failures that were partially attributable to moisture damage have not occurred since 1991. If forward going operating experience should reflect an increasing problem with standing water in manholes, sumps and vaults, as is described in the OC LRA, Appendix B, section B.1.36 discussion, the frequency of the inspection of manholes, sumps and vaults would be increased.

.

Audit question AMP-222 provides additional information on this aging management program. There are other conservatisms in the Oyster Creek inaccessible medium voltage cable aging management program. Most notably, all circuits within the scope of license renewal, in medium voltage

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applications (i.e., 2.4 kV, 4.16 kV, 13.8 kV and 34.5 kV) will be included in the aging management program and be condition monitored regardless of the period of time that they are exposed to significant moisture or system voltage.

.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 2/14/2006

Reviewed By: Micklo, Charles 2/14/2006

Approved By: Polaski, Fred

NRC Acceptance (Date):

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Item No		***Date Received:***	***Source***
AMP-337		2/13/2006	AMP Audit
Topic:		***Status:***	Closed

Document References:

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

Operating experience at OCGS suggest that 10 year testing frequency may not be adequate to monitor degradation of the cables. Why is the existing frequency of 6 yrs, for cable testing, implemented for the extended period of operation ?

Assigned To: Spamer, Deb

Response:

Oyster Creek has had several medium voltage cable failures and there has been extensive evaluation and subsequent implementation of corrective actions, specific and programmatic. Currently, Oyster Creek is implementing a medium voltage cable testing program as part of these corrective actions.

.

The OC Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements aging management program commitment is to implement a cable test using a proven test for detecting deterioration of the insulation system due to wetting. Until receipt of industry endorsement, Oyster Creek will continue to implement the existing cable testing program as a continuation of the implementation of corrective actions from past failures. A final determination on the B.1.36 aging management program test methodology awaits industry test endorsement.

.

The following information is related to the frequency of tests currently performed at Oyster Creek for inaccessible medium voltage cables.

.

The current Oyster Creek program includes cable testing for 2.4 kV and 4.16 kV circuits using three methodologies. Inclusion of the 13.8 kV and 34.5 kV circuits is intended but testing of these circuits has not yet been done. The three cable testing methodologies implemented are:
- On-line partial discharge testing via Cablewise DTE technology
- Power factor testing
- DC Step voltage testing.

The DTE testing is being implemented for 38 of the 47 circuits at 2.4 kV and 4.16 kV and is planned for implementation for all of the 13.8 kV and 34.5 kV circuits. Power factor and DC step voltage testing is only being implemented for circuits (9 total) where current configurations do not support

DTE testing methodology. All of the 2.4 kV and 4.16 kV circuits have been tested. All of the 4.16 kV circuits that can be tested via DTE methodology have been DTE tested in the past two years and current plan is start round two of testing as warranted by past test results. Note that DTE testing is not being performed under a routine work order and is being completed via corrective maintenance therefore there is currently no periodicity specified or controlled by maintenance planning.

.
Routine work orders have only been used for power factor and step voltage testing methodologies. Completed test frequencies showing in the library work orders for the non-DTE tests indicate that tests have occurred at varying frequencies from 4 to 10 years. Current frequency identified is every 3rd refuel outage, every 6 years.

.
The cables being tested by DC step voltage are the feeders to the recirculation pump motors (this is 5 of the 9 circuits not being DTE tested). These circuits contain original GE Vulkene cables. There have been no failures of the recirculation pump motor feeders at Oyster Creek. There are no license renewal intended functions for the recirculation pump motor feeders. These circuits are routed such that they are not subject to significant moisture. The inclusion of these circuits within the scope of the Oyster Creek B.1.36 program reflects conservatism in the completeness of circuits that are being included in the scope of this program for condition monitoring/testing. Any unacceptable test results will be evaluated via the corrective action process. In accordance with the LRA Appendix B discussion for this B.1.36 aging management program, test frequency will be adjusted based on the results obtained. Therefore, it is reasonable to implement a test frequency of 10 years, for the DC step voltage tests of the feeders for the recirculation pump motors.

.
The cables being tested by the power factor tests are the feeders from the start-up transformers, 1A and 1B, and the Auxiliary Transformer secondaries, 1A and 1B, to the 1A and 1B 4160 V buses (this is the remaining 4 of the 9 circuits not being DTE tested). These circuits contain Anaconda cables that were installed in 1979. There have been no failures of these circuits since their installation in 1979. The routing of these cables is via cable tray thereby making the failure mode of concern unlikely in that the cables are not susceptible to significant moisture. These circuits, which are not susceptible to significant moisture are therefore considered to have been conservatively included in the scope of this aging management program. Any unacceptable test results will be evaluated via the corrective action process. In accordance with the LRA Appendix B discussion for this B.1.36 aging management program, test frequency will be adjusted based on the results obtained. Therefore, it is reasonable to implement a test frequency of 10 years, for the power factor tests of the feeders from the auxiliary and start-up transformers.

.
LRCR 273 will implement changes to Appendix A Table A.05 commitment #36, Appendix A section A.1.36 and PBD-AMP-B.1.36, to explicitly state that cable test/monitoring frequency will be at least once every 10 years and will be adjusted based on test/monitoring results.

LRCR #: 273 ***LRA A.5 Commitment #:*** 36

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Spamer, Deb	2/15/2006
Reviewed By:	Micklo, Charles	2/15/2006
Approved By:	Polaski, Fred	
NRC Acceptance (Date):		

NRC Information Request Form

Item No
AMP-338

Date Received: 2/13/2006

Source AMP Audit

Topic:

Status: Closed

Document References:

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

The existing wording in LRA A. 1.36 and B.1.36 suggests that polarization index can be substituted for partial discharge test. Since polarization index test alone is not sufficient to detect aging effects of cable, will this be clarified in the LRA?

Assigned To: Spamer, Deb

Response:

Current test methodologies at Oyster Creek implement polarization index test as part of step voltage and meggar tests. It should be noted that Oyster Creek does not currently nor plan to use polarization index testing as the lone condition monitoring test in its B.1.36 aging management program.

.

LRCR 273 will delete polarization index testing from the Appendix A Table A.05 commitment #36, Appendix A section A.1.36, Appendix B section B.1.36 and PBD-AMP-B.1.36.

.

LRCR #: 273 *LRA A.5 Commitment #:* 36

IR#:

Approvals:

Prepared By: Spamer, Deb 2/15/2006

Reviewed By: Micklo, Charles 2/15/2006

Approved By: Polaski, Fred

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-339

Date Received: 2/13/2006

Source AMP Audit

Topic:

Status: Closed

Document References:

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

What are the existing DC hi-pot test voltages for new or installed medium voltage cables (2 KV, 5 KV, 13.8 KV and 34.5 KV cables)? DC hi-pot testing and its affect on cable degradation is an issue known to the industry for a while. The industry has changed the cable testing methodology from DC high pot tests to AC voltage tests and other tests such as power factor and partial discharge tests. The project team also has concerns on the existing practice of hi-pot testing including step voltage testing at OCGS and the potential adverse affect on the life of medium voltage cables including its connected loads. Provide basis to show that the present practice is acceptable at OCGS or indicate that OCGS does not plan to continue the existing DC hi-pot testing methodology for cable testing.

Assigned To: Spamer, Deb

Response:

New cable installations at Oyster Creek are hi-pot tested post-installation in accordance with manufacturer recommendations and standard industry practice to assure that no damage occurred during the installation. This post-installation, pre-energization test is typically to a voltage of 35kV.

.

Hi-pot testing is not currently being implemented at Oyster Creek as part of its medium voltage cable testing program. Hi-pot test work orders are being deferred to the currently implemented DTE partial discharge condition monitoring technology. (DTE stands for DTE Energy Company. The "DTE" condition monitoring being implemented was developed by Cablewise Services, a part of the DTE Energy Technologies Division. This methodology is on-line condition monitoring, that employs partial discharge technology as a diagnostic tool.) Step voltage testing is implemented for the 5 circuits feeding the 2.4 kV recirculation pump motors. These are the only cable tests being done that remotely resemble dc hi-pot testing. The non-applicability of the dc hi-pot testing concern is described below.

.

The current cable testing program for Oyster Creek's medium voltage cables does not credit hi-pot testing for condition monitoring. The cables in five OC circuits are currently dc step voltage tested to a maximum of 4kV. This maximum step voltage is less than the typical industry meggar test voltage of 5 kV, minimizing the potential of damaging cables/insulation. This test and its 4kV limit were

implemented to preclude subjecting the cables to a higher test voltage, and the associated industry concerns with hi-pot testing, while still being mostly aligned with a test voltage guideline of 2 times rated voltage plus 1kV. Industry issues with hi-pot testing are associated with test voltages on the order of 25 kV. Several industry standard practices as documented by EPRI and IEEE recognize and recommends testing that uses voltages as high as 10 kV to 12 kV.

.
No changes to the LRA or PBDs are recommended.

.
The 5 Oyster Creek cables subject to step voltage testing are power feeds to the recirculation pump motors and have been conservatively included in the OC PBD-AMP-B.1.36 program. Additional information on these circuits is repeated below from question AMP-337:
The cables being tested by dc step voltage are the feeders to the recirculation pump motors (this is 5 of the 9 circuits not being DTE tested). These circuits contain original GE Vulkene cables. There have been no failures of the recirculation pump motor feeders at Oyster Creek. There are no license renewal intended functions for the recirculation pump motor feeders. These circuits are routed such that they are not subject to significant moisture. The inclusion of these circuits within the scope of the Oyster Creek PBD-AMP-B.1.36 program reflects conservatism in the number of circuits that are being included in the scope of this program for condition monitoring/testing. Any unacceptable test results will be evaluated via the corrective action process.

.
Per IEEE Std 400-2001, concerns with DC testing of cables have been raised such that cables may fail, post-test, when they are returned to service. This concern is for cables that have been service aged in a wetted environment. The recirculation pump motor circuits are not routed in wetted environment.

.
Although the final test methodology for OC's PBD-AMP-B.1.36 aging management program is still to be specifically identified, awaiting industry endorsement, the current DC step voltage test provides the best alternative for testing these 5 OC recirculation pump motor circuits. This conclusion is supported by the following specific considerations for these five 2.4 kV circuits: specific operating experience; an operating voltage of 2.4 kV; the relatively low maximum step test voltage of 4 kV (i.e., less than meggar test voltages of 5 kV), the routing of these circuits such that they are not located in a wetted environment; and the fact that these circuits do not have a license renewal intended function.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: Spamer, Deb 2/15/2006

Reviewed By: Corsi, Lou 2/16/2006

Approved By: Polaski, Fred

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No
AMP-340

Date Received: 2/13/2006

Source AMP Audit

Topic:

Status: Closed

Document References:

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

Is addition of 34.5 KV and 13.8 KV cables considered additional scope or enhancements? GALL reconciliation document states that it is an enhancement to B.1.36. But, there are no enhancements identified in the LRA for this AMP.

Assigned To: Spamer, Deb

Response:

The Oyster Creek B.1.36 aging management program is a new program. The revision to the scope to include the 13.8 kV and 34.5 kV cables in the scope of license renewal does not constitute an enhancement, as the word "enhancement" is used with regard to license renewal aging management programs. Typically an enhancement would be associated with an existing aging management program.

Inclusion of the 13.8 kV system circuits in this program reflects the scope expansion of the Station Blackout System electrical commodities at the Forked River Combustion Turbine power plant. This was submitted to the NRC in the response to RAI 2.5.1.19-1 on 10/12/2006.

Inclusion of the 34.5 kV system circuits in this program reflects a change in scope for reconciliation of this new aging management program from the draft January 2005 GALL to the approved September 2005 GALL. It should be noted that the use of the word "enhancement" in the Oyster Creek reconciliation document means that the aging management program as written in the OC LRA was in need of revision to be reconciled to the changes in the September 2005 revision to NUREG-1801. The reconciliation document use of the word "enhancement" was not limited to existing OC programs.

AMR-325 followup question to AMP-222 provides additional information on this issue and also identifies License Renewal Change Request (LRCR) # 267 for document changes associated with the scope of aging management program B.1.36. Note that LRCR # 267 includes a draft of Appendix B, B.1.36 that reflects the inclusion of the in-scope 34.5 kV circuits as a revision to the scope of the program, not an enhancement.

LRCR #: 267 *LRA A.5 Commitment #:*

NRC Information Request Form

IR#:

Approvals:

Prepared By:	Spamer, Deb	2/14/2006
Reviewed By:	Micklo, Charles	2/14/2006
Approved By:	Polaski, Fred	

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-356

Date Received: 2/16/2006

Source AMP Audit

Topic:
IWE

Status: Open

Document References:

NRC Representative Morante, Rich

AmerGen (Took Issue):

<u>Question</u>

IWE AMP
Question 4 IWE AMP Revised Feb. 17, 2006 R. Morante (AMP-356)

(1) Identify the specific locations around the circumference in the former sandbed region where UT thickness readings have been and will be taken from inside containment. Confirm that all points previously recorded will be included in future inspections.

(2) Describe the grid pattern at each location (meridional length, circumferential length, grid point spacing, total number of point readings), and graphically locate each grid pattern within the former sandbed region.

(3) For each grid location, submit a graph of remaining thickness versus time, using the UT readings since the initiation of the program (both prior to and following removal of the sand and application of the external coating).

(4) Clearly describe the methodology and acceptance criteria that is applied to each grid of point thickness readings, including both global (entire array) evaluation and local (subregion of array) evaluation.

Assigned To: Ouaou, Ahmed

Response:

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:

NRC Information Request Form

Reviewed By:

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-357

Date Received: 2/16/2006

Source AMP Audit

Status: Open

Topic:
IWE

Document References:

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

(1) When a new set of point thickness readings is taken is the former sandbed region, prior to entering the LR period, what will be the quantitative acceptance criteria for concluding that corrosion has or has not occurred since the last inspection in 1996.

(2) If additional corrosion is detected in the upcoming inspection, describe in detail the augmented inspections and other steps that will be taken to evaluate the extent of the corrosion, and describe the approach to ensuring the continued structural adequacy of the containment.

Assigned To: Ouaou, Ahmed

Response:

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:

Reviewed By:

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMP-358

Date Received: 2/17/2006

Source AMP Audit

Status: Open

Topic:
CUF Reevaluation

Document References:
3.1

NRC Representative Chang, Ken

AmerGen (Took Issue): Warfel, Don

Question

QUESTIONS OF RORC MEETING (06-03) REPORT

As part of the review for AMP B.3.1, "Metal Fatigue of Reactor Coolant pressure boundary" the project team reviewed OC's PORC meeting (06-03) report, summarized the presentation, and reviewed OC-2006 – E-001, Rev O, "Revised Method for Determination of Fatigue Cumulative Usage Factor". OC used modern codes and revised STET the acceptance criteria for fatigue CUF. The PORC disposition is approved with recommendations with conditions. The project team does not question the use of the modern code, since it is a reasonable step to take, but has the following questions requiring clarification or justification.:

1.)Some RPV components are designed to a criterion established by GE specification 21A1105. Please provide a copy for NRC Staff review.

2.)The project team agrees that the design code of record does not require or specify fatigue analysis requirements. Nor were there any regulating design requirements for fatigue analysis at the time of design. An explanation is requested as to why GE included a prudent measure to limit the CUF to 0.8. Why didn't GE allow CUF of 1.0? Was CUF of 1.0-0.8=0.2 intentionally reserved for margin" The PORC report stated that this is not considered as a departure from the design (CUF 1.0) methodology. Please justify the statement.

3.)□PORC question (2) states that "this activity involves a change to the methodology for the determination of the Fatigue CUF" What change does it refer to? As for determination of CUF=å Ni where Ni is actual on design cycles and NI is the

NI

Allowable cycles for the I th transient pair. Please clarify.

4)□It seems to the project team that there is no change in methodology. The only thing changed is the CUF limit (from 0.8 to 1.0)) Was GE consulted to verify that it is acceptable w/o violating some original design concerns.

5) If OC changes the CUF from, 0.8 (design) to 1.0 for LR, how could one conclude that this activity

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has no adverse affect w/o justification? If they change from 0.8 to 0.7, the logic is obvious.

6) Is GE SPEC 21A1105 voided? If so, what is the new spec OC used today for the PEO?
7) OC credited the new fatigue analysis as justification to the change of CUF. Please consider, if everything (condition) remains unchanged, if the original design meets CUF of 0.8, naturally, one will meet CUF if 1.0 today. What is the purpose of these analysis? Why don't you show that the CUF today is less than 0.8 but will be allowed to go up t 1.0 including environmental impact for the PEO?
8) The team would like to review the basis of justifying the CUF for FW Nozzle and Recir. Outlet Nozzle & RPV outlet

Assigned To: May, Mike

Response:

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By:

Reviewed By:

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-100

Date Received: 9/30/2005

Source AMR Audit

Topic:
Rx Internals- TLAAs

Status: Accepted by NRC

Document References:
Sect. 3

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

In Table 3.1.2.1.4, the applicant credits TLAA to manage fatigue damage for RV internal components. Please confirm that TLAA for those items do exist. If not, please explain how the applicant is going to manage fatigue damage. Note: The above question applies to other Tables also. Please ensure that all the Table 2 items which credit TLAA do have TLAA. For examples, In Table 3.1.2.1.5, Nozzle thermal sleeves are credited TLAA.

Assigned To: May, Mike

Response:

The use of TLAA in Section 3 has been reviewed. The use of TLAA as an aging management program in LRA Table 3.1.2.1.4 "Reactor Internals" and Table 3.1.2.1.5 "Reactor Pressure Vessel" indicates that the current licensing basis was reviewed for TLAAs and the fatigue analysis was evaluated where one existed for that component. However, several components for which TLAA was identified as the aging management program for the cumulative fatigue aging effect do not have fatigue analyses. These components include the reactor internals and the CRD and Feedwater nozzle thermal sleeves. In the absence of a fatigue analysis for these components, the effects of cumulative fatigue are managed by other aging management programs. For example, cumulative fatigue effects in reactor internal components are managed by the "BWR Vessel Internals" aging management program. Similarly, the BWR Feedwater Nozzle and BWR CRD Return Line Nozzle aging management programs manage the effects of cumulative fatigue in the thermal sleeves for the Feedwater and CRD Return Line nozzles, respectively.

LRA Table 3.1.2.1.4 "Reactor Internals" and Table 3.1.2.1.5 "Reactor Pressure Vessel" (which includes the CRD and Feedwater nozzle thermal sleeves) will be revised to delete the TLAA aging management program for components where a TLAA does not exist. The appropriate aging management program will be identified with an "E" Industry Standard note and a plant specific note stating "There is no fatigue analysis for this component. The aging effect of cumulative fatigue is managed by the BWR Vessel Internals aging management program". Similarly for the thermal sleeves the note will read: "There is no fatigue analysis for this component. The aging effect of cumulative fatigue is managed by the BWR Feedwater Nozzle (or BWR CRD Return Line Nozzle, as

applicable) aging management program".

LRCR #: 241 *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: May, Mike 10/ 7/2005

Reviewed By: Miller, Mark 12/20/2005

Approved By: Warfel, Don 12/20/2005

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-150

Date Received: 10/20/2005

Source AMR Audit

Topic:
CLB fatigue analysis

Status: Closed

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

The OGGS LRA contains 217 references to TLAAs in the AMR tables. All but a few cite cumulative fatigue damage as the aging effect requiring management. After review of the information contained in the LRA, Chapters 3 and 4, the project team has a number of questions related to TLAAs for cumulative fatigue damage.

In following the AMR line item references for mechanical components back to the Table 1 entries, then to the further evaluations, and finally to LRA Section 4.3, it is not always clear whether a CLB fatigue analysis actually exists or whether the TLAA is addressed by the 7,000 assumed cycles in accordance with B31.1 or equivalent design methods. To clarify this, please identify the applicable disposition for each TLAA line item related to cumulative fatigue damage of mechanical components (piping, fittings, nozzles, valves, pumps, etc.) Also identify which subsection of LRA 4.3 applies.

Assigned To: May, Mike

Response:

There are two categories of fatigue TLAAs identified in the AMR tables. The first category is for components for which an explicit fatigue analysis exists, such as one performed in accordance with ASME Section III, Class 1 rules (or equivalent), with an associated Cumulative Usage Factor (CUF) value. The second category is for components that were designed in accordance with implicit fatigue design rules from ANSI B31.1 (or equivalent). The attached table identifies whether a system or component has an explicit (E) or implicit (I) fatigue analysis associated with it.

For License Renewal, additional explicit fatigue analyses were prepared to consider the effects of environmental fatigue for the components identified in NUREG/CR-6260. These components are denoted in the table as also having an explicit environmental (E-env) fatigue analysis in addition to the original analysis. The components within each system bounded by the applicable environmental fatigue analysis are also denoted with a (E-env) in the attached table.

The table also includes a column denoting the disposition method used to manage the TLAA for the period of extended operation. The notation (i) indicates the existing analysis was determined to

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remain valid for the period of extended operation. The notation (ii) indicates the analysis was revised to become valid for the period of extended operation. The notation (iii) indicates fatigue monitoring will be used to assure the fatigue analysis will remain valid during the period of extended operation or will be reanalyzed as necessary prior to exceeding the design limit.

(Note: There are several line items associated with reactor vessel internals for which the column denoting Explicit or Implicit shows None, since no fatigue analyses exists for these components. The response to AMR Question AMP-100 addressed this issue. As stated in the response to AMP-100, Table 3.1.2.1.4 and Table 3.1.2.1.5 will be revised to delete reference to a TLAA where no TLAA exists).

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Guthrie, Mike 1/ 5/2005

Reviewed By: May, Mike 1/ 6/2006

Approved By: Warfel, Don 1/ 6/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-151

Date Received: 10/20/2005

Source AMR Audit

Status: Closed

Topic:
Cumulative fatigue damage of bolted closures

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

The OGGS LRA contains 217 references to TLAAs in the AMR tables. All but a few cite cumulative fatigue damage as the aging effect requiring management. After review of the information contained in the LRA, Chapters 3 and 4, the project team has a number of questions related to TLAAs for cumulative fatigue damage.

In the LRA Section 3.1, 3.2, 3.3 and 3.4 AMR tables, there are a number of references to TLAAs related to cumulative fatigue damage of bolted closures. The intended function is pressure boundary or leakage boundary. Normally a bolted closure in a pressure retaining boundary is designed such that there is no load cycling in the bolts, because they are very susceptible to fatigue failure, by nature of the as-designed stress raiser at the root of the threads. Load cycling is essentially eliminated by use of bolt preload. Please clarify and provide more detail related to these specific AMR table line items.

Assigned To: May, Mike

Response:

The Oyster Creek LRA identified cumulative fatigue damage as an applicable aging effect for all reactor coolant pressure boundary components, including the bolted closures addressed in LRA Sections 3.1, 3.2, 3.3, and 3.4. These bolted closures are considered to be part of the pressure boundary and would have been included within the implicit fatigue evaluation of the piping system. The number of thermal transients anticipated for the reactor coolant system during the original 40-year design of the plant would have been considered in evaluating the bolting. Therefore, these fatigue evaluations are considered to be TLAAs.

The Oyster Creek LRA Table 4.3.1-1 includes 60-year transient cycle projections that show the total number of transient cycles will not exceed 7,000 during the period of extended operation. Therefore, the design considerations made for the implicit fatigue evaluations for the reactor coolant pressure boundary components will remain valid through the period of extended operation.

LRCR #:

LRA A.5 Commitment #:

NRC Information Request Form

IR#:

Approvals:

Prepared By:	Guthrie, Mike	2/17/2006
Reviewed By:	May, Mike	2/17/2006
Approved By:	Warfel, Don	2/17/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-152

Date Received: 10/20/2005

Source AMR Audit

Topic:
Technical Basis Documents for AMR Line Items

Status: Closed

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

A large number of AMR line items in LRA Sections 3.1 through 3.6 reference further evaluations, which are provided in the LRA Sections 3.1.2.2 through 3.6.2.2, respectively. Please ensure that the technical basis document for each further evaluation in LRA Sections 3.1.2.2 through 3.6.2.2 is available for review by the project team during the on-site AMR audit, preferably in both hard-copy and electronic formats.

Assigned To: Fulvio, Al

Response:

The AMR Technical Basis Documents have been completed and will be given to the NRC auditors on-site on Monday, Feb 13 in both hard copy and electronic format.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Fulvio, Al 2/ 7/2006

Reviewed By: Hufnagel, John 2/ 7/2006

Approved By: Warfel, Don 2/ 7/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No	***Date Received:***	***Source***
AMR-153	10/20/2005	AMR Audit
Topic:	***Status:***	Closed

Reconcile AMRs in LRA and 9/05 GALL Recommendations

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

The OCGS LRA was developed based on the January 2005 draft version of the updated GALL. A final updated version of GALL, released in September 2005, may contain revisions that are applicable to the OCGS LRA. Please provide a documented reconciliation (identification of applicable differences and a technical assessment of significance) between the AMRs in the OCGS LRA and the recommendations in the September 2005 GALL final update.

Assigned To: Getz, Stu

Response:

Please reference the Oyster Creek Generating Station License Renewal Document, "Reconciliation of Program and Line Item Differences Between January 2005 Draft NUREG-1801 and September 2005 NUREG-1801 Revision 1."

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Getz, Stu	1/23/2006
Reviewed By:	Corsi, Lou	1/27/2006
Approved By:	Warfel, Don	1/27/2006

NRC Acceptance (Date): 1/27/2006

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Item No		***Date Received:***	***Source***
AMR-162		10/31/2005	AMR Audit
Topic:		***Status:***	Closed

Environmental Qualification (EQ) Program (GALL AMP X.E1)

Document References:

B.3.2

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

Provide clarification whether the Oyster Creek EQ Program includes all electrical components that are important to safety and could be exposed to harsh environment accident conditions.

Assigned To: May, Mike

Response:

The Oyster Creek EQ Program includes all electrical components that are important to safety and could be exposed to harsh environment accident conditions. This is confirmed by the following license renewal related documents:

PBD-AMP-B.3.02, section 3.1 states, "The Oyster Creek Environmental Qualification Program is an existing program that manages the qualification of electrical components that are important to safety and could be exposed to harsh environment accident conditions, as defined in the Code of Federal Regulations, Title 10 Part 50.49, "Environmental Qualification of Electrical Equipment Important to Safety for Nuclear Power Plants," and Regulatory Guide 1.89."

UFSAR Paragraph 3.11.1.1.1 states, "The EQ program addresses all electrical equipment important to safety as defined in 10 CFR 50.49(b)(1),(2), and (3). The EQ Master List, GPUN document No. 990-1464, identifies electrical equipment or components which must be environmentally qualified for use in a harsh environment."

LRA, Section B.3.2, states "All EQ equipment is included within the scope of license renewal. The program provides for maintenance of the qualified life for electrical equipment important to safety within the scope of 10 CFR 50.49."

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

NRC Information Request Form

Prepared By:	May, Mike	12/20/2005
Reviewed By:	Beck, George	12/20/2005
Approved By:	Warfel, Don	1/ 3/2006
NRC Acceptance (Date):		

NRC Information Request Form

Item No
AMR-163

Date Received: 10/31/2005

Source AMR Audit

Status: Closed

Topic:
Environmental Qualification (EQ) Program (GALL AMP X.E1)

Document References:
B.3.2

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

GALL AMP X.E1 recommends that monitoring or inspection of certain environmental, condition, or component parameters may be used to ensure that a component is within the bounds of its qualification basis, or as a means to modify the qualification, for Program Elements 3, 4, and 5. The applicant is requested to address how this is accomplished for its OCGS AMP B.3.2.

Assigned To: May, Mike

Response:

The OC EQ program allows monitoring or inspection of certain environmental conditions, or component parameters to ensure that a component is within the bounds of its qualification basis or to modify the qualification of a component. Temperature monitoring is a typical application of monitoring of environmental conditions to ensure qualified life. OC has used temperature monitoring in the past to modify the qualified life of a component where required. However, as noted in the program basis document for EQ (PBD-AMP-B.3.02), the temperature data used in aging evaluations is based on plant design temperatures, except as noted above.

In Section 3.4 and 3.5 of PBD-AMP-B.3.02, it is stated that the Oyster Creek Environmental Qualification Program does not monitor for detection of aging effects through surveillance and maintenance activities. If required for qualification, surveillance or maintenance activities can be performed within the EQ Program. The details for such activities would be specified in the component EQ binder.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: May, Mike 1/ 4/2006

Reviewed By: Beck, George 1/ 4/2006

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Approved By: Warfel, Don 1/ 5/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-164

Date Received: 10/31/2005

Source
AMR Audit

Status: Open

Topic:
Inaccessible Portion of the Drywell Shell

Document References:
3.5.2.2.1

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

The applicant has not addressed aging management of the portion of the drywell shell embedded in the drywell concrete floor. This area is inaccessible for inspection, but is potentially subject to wetting on both the inside and outside surfaces. The applicant is requested to submit its AMR for this inaccessible portion of the drywell shell.

Assigned To: Ouaou, Ahmed

Response:

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By:

Reviewed By:

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-165

Date Received: 10/31/2005

Source AMR Audit

Status: Closed

Topic:
Containment Penetration Bellows

Document References:
3.5.2.2.1

NRC Representative Hoang, Dan

AmerGen (Took Issue):

Question

The Dresden/Quad Cities BWR units have a history of problems with containment penetration bellows, and the licensee has a long-term replacement program that will continue into the LR period. The applicant is requested to address this industry operating experience and submit a specific technical basis why the Oyster Creek containment penetration bellows are not subject to the aging effects and aging mechanisms observed at Dresden/Quad Cities.

Assigned To: Ouaou, Ahmed

Response:

The Dresden/Quad cities operating experience was reviewed and determined not applicable to Oyster Creek. As stated in NUREG-1796 "Safety Evaluation Report Related to the License Renewal of the Dresden Nuclear Power Station, Units 2 and 3 and Quad Cities Nuclear Power Station, Units 1 and 2" Section 3.5.2.2.1, response to RAI 3.5-6, the root cause of the bellows assembly degradation was attributed to cracking due to transgranular stress corrosion cracking (TGSCC). Quad Cities Unit 1 X-16A bellows, replaced in 1984, was found to be contaminated with "magnesium salts." The corrosive species responsible for crack initiation on Quad Cities Unit 1 X-25 bellows were identified as chlorides, fluorides, and sulfides. Dresden/Quad Cities determined that the operating environments of the bellows do not contain these contaminants and conclude that they were most probably introduced during construction

Oyster Creek containment penetrations have expansion bellows on main steam lines, feedwater lines, the vent system, and containment vacuum breakers system. Like Dresden/Quad Cities, the bellow assemblies are exposed to two environments; containment atmosphere (either drywell or suppression chamber air space) and indoor air. Neither environment contains aggressive agents. The environments are further described in LRA 3.0-1 and 3.0-2.

Thus, stress Corrosion (SCC) is not expected to occur in the containment penetration bellows because their operating environment is not corrosive. The Dresden/Quad Cities problem was attributed to construction or fabrication issues related to their bellows. Furthermore the problem was identified by 10 CFR Part 50 Appendix J testing. The Oyster Creek 10 CFR Part 50 Appendix J has not identified similar problem with the bellows. Consequently there are no plans to replace or begin replacement of the existing bellows.

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Oyster Creek has committed to implementing the requirements of ASME Section XI, Subsection IWE, Examination Category E-A for containment surfaces, and 10 CFR Part 50 Appendix J testing for the containment penetration bellows (Examination Category EP) during the period of extended operation. These aging management programs are sufficient to detect potential leakage through the bellows as required by the Oyster Creek Technical Specifications. If the programs identity conditions similar to Dresden/Quad Cities concern, corrective actions will be taken in accordance with the corrective action process to ensure that containment leakage is in accordance with the Technical Specifications.

References:

1. NUREG-1796, "Safety Evaluation Report Related to the License Renewal of the Dresden Nuclear Power Station, Units 2 and 3 and Quad Cities Nuclear Power Plant Station, Units 1 and 2", October 2004,

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 12/27/2005

Reviewed By: Quintenz, Tom 1/ 9/2006

Approved By: Warfel, Don 1/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-166

Date Received: 10/31/2005

Source AMR Audit

Status: Closed

Topic:
Freshwater Pump House and the Service Water Seal Well

Document References:
3.5.2.2.2

NRC Representative Hoang, Dan

AmerGen (Took Issue):

Question

More information is needed about the water-flowing and aggressive environments for the freshwater pump house and the service water seal well, and the operating experience for these structures. Has degradation been observed, monitored, repaired? Are there any special considerations (e.g., more frequent inspections, more detailed inspections) over and above the normal SMP inspection procedures? If not, explain why it is not necessary.

Assigned To: Ouaou, Ahmed

Response:

The freshwater pump house is located at the Fire Pond Dam south west of the Reactor Building outside the protected area. The pump house supplies water for the fire protection system. As discussed in LRA, paragraph 3.5.2.2.2.2, the pump house is subject to "Raw Water - Fresh Water" environment described in LRA Table 3.0-2. Chemistry analysis of the water indicates that it is slightly aggressive because pH=4.8 and is less than 5.5 specified in NUREG-1801. The chloride and sulfate contents are below the aggressive limits (12 ppm and 6 ppm respectively) specified in NUREG-1801. The water is generally standing; except for low natural stream velocity, and low velocity due to fire pump operation, thus the label "water-flowing".

The freshwater pump house is monitored on a frequency of 4 years under the Structures Monitoring Program B.1.31). Inspection of accessible areas of the structure above the water level was conducted in 2002. The inspection results indicate that the structure is structurally sound. Operating experience (OE) review did not identify objective evidence that inaccessible and under water areas of the structure have been inspected previously. The OE review noted that the pump bays were desilted in late 2003. There were no reports of structural concerns by the desilting team. The OE review also did not indicate that repairs were made in the past.

The freshwater pump house is not subject to special considerations, such as more frequent or detailed inspections above the normal Structure Monitoring Program. There are no special considerations for inspecting inaccessible and underwater portion of the structure under the current term. However the structure will be subject to special considerations during the period of extended

operation as discussed below.

The Service Water system (SWS) Seal Well is a reinforced concrete 2-cell junction box, partly above ground, that is in the flow path of the service water system return line to the discharge canal. The 2 cells are separated by a 4-foot high concrete wall that acts as a weir over which water discharged from SWS line overflows and drains out through a 30" diameter drain at the bottom of the second cell. The drain line is connected to the Roof Drains and Overboard Discharge system (Section 2.3.3.33) which conveys water to the discharge canal. The weir overflow was considered "water-flowing" environment.

The internal surfaces of the junction box are subject to "Raw Water-Salt Water" environment described in LRA Table 3.0-2. The environment is aggressive (pH = 7.9, chlorides = 14,659 ppm, and sulfates = 1,419 ppm) because the chloride limit specified in NUREG-1801 (< 500 ppm) is exceeded.

The SWS Seal Well is not currently monitored under the Structures Monitoring Program (B.1.31). There is documented evidence that the SWS Seal Well has been inspected previously in October 1999. As a result of this inspection there are records indicating interior surfaces of the structure were coated with an elastomer to protect against concrete degradation. The coating, however, is not monitored on regular basis such that it could be credited for managing aging of concrete. Observed exterior surfaces of the above ground structure that are exposed to the water-flowing and aggressive Raw Water-Salt Water environment described above on internal surfaces, shows rust stains and cracking. However the structure appears acceptable. An Issue Report (IR), was issued in accordance with the corrective action process to determine why the structure is not in scope of the Maintenance Rule Structures Monitoring Program, and to evaluate its condition for the current term. For license renewal, AmerGen has committed to including the SWS Seal Well in the scope of the Structures Monitoring Program. The structure will be subject to special consideration if the initial inspection, discussed below, shows that it is required.

As indicated in LRA Tables 3.5.2.1.9 and 3.5.2.1.12, the freshwater pump house and the SWS Seal Well will be monitored under the Structures Monitoring Program on a frequency of 4 years during period of extended operation. The initial inspection will be completed prior to entering the period of extended operation. The results of this inspection will be evaluated to determine if any corrective actions are required or if more frequent inspections are warranted to ensure that the intended function of the structures is maintained. Inaccessible areas of the structures will be inspected as per the Structures Monitoring Program if exposed by excavation for any reason, and if observed conditions in accessible areas, which are exposed to the same environment, show that significant concrete degradation is occurring.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

NRC Information Request Form

Prepared By:	Ouaou, Ahmed	12/28/2005
Reviewed By:	Quintenz, Tom	1/11/2006
Approved By:	Warfel, Don	1/12/2006
NRC Acceptance (Date):		

NRC Information Request Form

Item No
AMR-167

Date Received: 10/31/2005

Source AMR Audit

Status: Open

Topic:
Reactor Building Drywell Shield Wall

Document References:
3.5.2.2.2

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

More information is needed about the elevated temperature condition in the reactor building drywell shield wall. When was the condition first discovered? What was the extent of the elevated temperature region and what was the extent of the cracked region (distribution, length, width of cracks) when first discovered? When did NRC conclude that this condition is acceptable? Did this conclusion consider the remaining operating life of OC at that time? Describe the monitoring program, including the dates and quantitative results obtained, since NRC acceptance of the condition. Currently, what is the extent of the elevated temperature region and what is the extent of the cracked region (distribution, length, width of cracks)? Has there been a need to conduct re-analysis or make any repairs? Is the LR commitment under the OCGS SMP greater than, equal to, or less than the condition monitoring activities currently being conducted to satisfy the NRC staff's recommendation?

Follow-Up Question:

As follow-up to the applicant's response, the project team reviewed References 3 and 5, and ABB Impell Corporation Report # 03-0370-1341, Oyster Creek Nuclear Generating Station Structural Evaluation of the Spent Fuel Pool, Rev. 0, June 29, 1992. Based on its review, the project team has a concern that several potential aging issues may not have not been adequately addressed, in consideration of an additional 20 years of operation. These relate to known degradation of the drywell shield wall (DSW), the biological shield wall (BSW), and the spent fuel pool supporting structural elements.

The applicant is requested to review Ref. 3 and describe how it has implemented the following elements of the staff's SER:

(1) The staff's crack width acceptance criterion (0.02), above which repairs should be made to prevent water intrusion and potential corrosion of rebar in the drywell shield wall.

(2 The OCGS statement in Ref. 4 that it is developing procedures for monitoring the condition of the DSW during each refueling outage.

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(3) The OCGS statement in Ref. 4 that it has assigned a structural-system engineer to the OCGS site who is responsible for ensuring that the structures at the site are monitored and evaluated. (Ref. 3 states: The staff believes that this blanket commitment by the licensee, if properly implemented, would ensure the continued function of the BSW.)

The applicant is also requested to address the conclusion in the cited IMPELL Report, Section 5.4 Conclusions, (4), related to the effects of consolidated fuel loads.
Has OCGS implemented a fuel rack change that increases the total fuel load in the spent fuel pool?

The applicant is further requested to address the cracking in the spent fuel area that the cited analysis predicted and compared to actual observations of cracking. What is the applicant's aging management commitment for these cracks.

Assigned To: Ouaou, Ahmed

Response:

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:

Reviewed By:

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No	***Date Received:***	***Source***
AMR-168	10/31/2005	AMR Audit
	Status:	Closed

Topic:
Aging Management of Inaccessible Concrete Areas

Document References:
3.5.2.2.2

NRC Representative Hoang, Dan

AmerGen (Took Issue):

Question

More information is needed about aging management of inaccessible concrete areas. The applicant is requested to submit the dates and complete results (at specific locations/not averages or ranges) of all past groundwater monitoring tests. Discuss why the groundwater is non-aggressive, but the fire pond water is "slightly" aggressive. Confirm that the OCGS SMP credited for LR will inspect all inaccessible areas that may be exposed by excavation for any reason, whether the environment is considered aggressive or not, and also will inspect any inaccessible area where observed conditions in accessible areas, which are exposed to the same environment, show that significant concrete degradation is occurring.

Assigned To: Ouaou, Ahmed

Response:

Under the current term, Oyster Creek monitors groundwater to ensure that the plant's permitted emissions and discharges are within regulatory limits. There are no requirements to monitor groundwater for pH, chlorides, or sulfates to establish whether if it is aggressive to concrete. The only chemistry test results available for this purpose are those taken for license renewal aging managements review. Dates, location, and the test results are described below. Oyster Creek is committed to sample and test groundwater every 4 years during the period of extended operation.

Sample date: 10/29/2004
Sample Location: Groundwater well north of the Reactor building

Parameter	Result	Analysis Date
PH	6.4	10/29/2004
Chloride	138	10/30/2004
Sulfate	73	10/30/2004

Sample date: 10/29/2004

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Sample Location: Groundwater well West of Turbine building

Parameter	Result	Analysis Date
PH	5.6	10/29/2004
Chloride	3	10/30/2004
Sulfate	7	10/30/2004

Sample date: 10/29/2004
Sample Location: Intake Structure and Canal (Raw Water – Salt Water)

Parameter	Result	Analysis Date
PH	7.9	10/29/2004
Chloride	14,659	10/30/2004
Sulfate	1,419	10/30/2004

Sample Date: 10/29/2004
Sample Location: Fire Pond Dam (Raw Water – Fresh Water)

Parameter	Result	Analysis Date
PH	4.8	10/29/2004
Chloride	12	10/30/2004
Sulfate	6	10/30/2004

Based on water chemistry results presented above, pH for the water sample taken at the Fire Pond Dam is 4.8 which we considered slightly aggressive to concrete because it less than 5.5 limit specified in industry documents and in NUREG-1801. Groundwater samples taken at the well north of the Reactor building and at the well west of the Turbine building have a pH of 6.4 and 5.6 respectively. Both values are greater than the 5.5 limit and thus non-aggressive.

Oyster Creek will inspect inaccessible areas of structure in scope of license renewal that are exposed by excavation for any reason, whether the environment is considered aggressive or not. Inaccessible areas of structures in the scope of license renewal will be inspected if observed conditions in accessible areas, which are exposed to the same environment, show that significant concrete degradation is occurring.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 12/28/2005

NRC Information Request Form

Reviewed By:	Muggleston, Kevin	1/ 4/2005
Approved By:	Warfel, Don	1/ 4/2006
NRC Acceptance (Date):		

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Item No
AMR-169

Date Received: 10/31/2005

Source
AMR Audit

Status: Closed

Topic:
Equipment Pool and Reactor Cavity Walls Rebar Corrosion

Document References:
3.5.2.3

NRC Representative Hoang, Dan

AmerGen (Took Issue):

Question

The only LRA information about the Equipment Pool and Reactor Cavity Walls Rebar Corrosion is presented below this question. It is not discussed in LRA Section 3.5.2.2, Table 3.5.1, Tables 3.5.2.2.x, or under operating experience in Appendix B.

More information is needed about the Equipment Pool and Reactor Cavity Walls Rebar Corrosion. When was the condition first discovered? When was the concrete core sample taken? What was the extent of rebar corrosion (surface area, depth into concrete, rebar diameter loss) when first discovered? Was the source of water leakage ever determined? Was any remedial action taken? Once informed, did the NRC staff conduct a safety evaluation of this condition? If so, where is it documented and what did it conclude? If applicable, did this conclusion consider the remaining operating life of OC at that time? Describe the inspections, including the dates and results obtained, that have been conducted since the initial estimate of a corrosion rate. Currently, what is the extent of rebar corrosion (surface area, depth into concrete, rebar diameter loss)? Has there been a re-analysis of the structures to account for the rebar corrosion? Have any repairs been made? Is there an LR commitment under the OCGS SMP to conduct enhanced inspections (e.g., more frequent inspections, more detailed inspections) to monitor the progress of rebar corrosion during the extended period of operation? If not, explain why it is not necessary.

(FROM THE OCGS LRA)

3.5.2.3 Time-Limited Aging Analyses

The time-limited aging analyses identified below are associated with the Primary Containment, Structures, and Component Supports components:

- Section 4.6, Primary Containment, Attached Piping and Components

- Section 4.7.1, Reactor Building Crane, Turbine Building Crane, Heater Bay Crane Load Cycles

- Section 4.7.2, Drywell Corrosion

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• Section 4.7.3, Equipment Pool and Reactor Cavity Walls Rebar Corrosion

4.7.3 EQUIPMENT POOL AND REACTOR CAVITY WALLS REBAR CORROSION

Summary Description

In a letter to the NRC discussing drywell corrosion, it was reported that leakage was observed in the vicinity of the equipment pool and reactor cavity walls, indicating slight corrosion of the reinforcing bar (Reference 4.8.26). Based on a representative concrete core sample, it was conservatively estimated that the diameter of a typical reinforcing rebar in the localized area could be expected to be reduced by 0.002 inch/year. The walls in question are reinforced with #8 and #11 rebar. Assuming the corrosion continues for the entire 40-year life of the plant the diameter of the reinforcing bar would be reduced by 8% and 6% respectively. The corrosion was localized and the reduced reinforcing bar diameter was judged to have no impact on the concrete integrity.

Analysis

The equipment pool and reactor cavity walls were recently visually inspected. The walls indicated no signs of water intrusion. No indications of further deterioration were observed. Conservatively assuming the above corrosion rates continue for the end of the period of extended operation, the diameter of the #8 and #11 reinforcing bar are estimated to reduce by 12% and 9%, respectively. Since the corrosion continues to be localized there is no significant impact on the integrity of the concrete.

Disposition: 10 CFR 54.21(c)(1)(ii)

The corrosion of the reinforcing bar has been projected to end of the period of extended operation. The integrity of the concrete will be maintained even if the reinforcing bar corrosion continues to the end of the period of extended operation.

A.4.5.3 Equipment Pool and Reactor Cavity Walls Rebar Corrosion

Corrosion was found on a rebar in a localized area in the vicinity of the equipment pool and the analysis of the corrosion rate is a TLAA. The corrosion of the reinforcing bar has been projected to the end of the extended period in accordance with 10 CFR 54.21(c)(1)(ii), and determined that the integrity of the concrete will be maintained through the period of extended operation.

Assigned To: Ouaou, Ahmed

Response:

More information is needed about the Equipment Pool and Reactor Cavity Walls Rebar Corrosion.

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a) When was the condition first discovered?
Response: The condition was discovered in mid-late 1980's as a result of GPU's actions to address the potential impact of water leakage on other structures and equipment in addition to the drywell shell in the sand bed region. The condition was reported to the NRC in a letter dated December 5, 1990 (ref. 1)

b) When was the concrete core sample taken?
Response: Core samples were taken in October 1988.

c) What was the extent of rebar corrosion (surface area, depth into concrete, rebar diameter loss) when first discovered?
Response: Existing documentation does not provide the requested detail. However the December 5, 1990 letter referenced above noted that analysis of the core samples indicates the diameter of a typical reinforcing bar could be reduced by 0.002 inch per year.

d) Was the source of water leakage ever determined?
Response: Yes. The source of water was determined to be from the flooded reactor cavity and equipment pool during refueling outages.

e) Was any remedial action taken?
Response: No remedial actions were found necessary. Corrosion was determined to be localized, insignificant and has no impact on concrete integrity.

f) Once informed, did the NRC staff conduct a safety evaluation of this condition?
Response: As noted in response to item a) above, the corrosion and the condition that led to its discovery were reported to NRC in December 5, 1990. We have no documentation or knowledge of whether the Staff conducted a safety evaluation or not.

g) If so, where is it documented and what did it conclude?
Response: Refer to f) above.

h) If applicable, did this conclusion consider the remaining operating life of OC at that time?
Response: Not applicable

i) Describe the inspections, including the dates and results obtained, that have been conducted since the initial estimate of a corrosion rate.
Response: Inspections are included in the Structures Monitoring Program. The inspections frequency however is every refueling outage (every 2 years) instead of the normal frequency of 4 years because the same walls are affected by drywell elevated temperature (refer to AMP-167). The inspection consists of visual examination of the affected area for water and rust stains. The observed condition during each inspection is compared to the condition noted during the previous inspection. The results to date indicate little change has occurred since the initial inspection.

j) Currently, what is the extent of rebar corrosion (surface area, depth into concrete, rebar diameter loss)?

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Response: Based on visual inspection of the walls, we concluded that rebar corrosion has not worsened. Thus the original corrosion rate of 0.002 inch per year is conservative and can be applied to the rebar through the period of extended operation. The rebar diameter loss through the period of extended operation is expected to be no more than 12% for #8 rebar and 9% for #11 rebar.

k) Has there been a re-analysis of the structures to account for the rebar corrosion?
Response: We did not identify documentation that indicates a re-analysis was done specifically to account for rebar corrosion. This is not unexpected, since rebar corrosion was localized and the corrosion rate is small such that loss of rebar material will have no impact on the structural integrity of the walls. However the analysis conducted to evaluate the effects of drywell elevated temperature on the drywell shield wall included walls with rebar corrosion (ref.2).

l) Have any repairs been made?
Response: We have no record to indicate that any repairs were made.

m) Is there an LR commitment under the OCGS SMP to conduct enhanced inspections (e.g., more frequent inspections, more detailed inspections) to monitor the progress of rebar corrosion during the extended period of operation? If not, explain why it is not necessary.
Response: Rebar corrosion was determined to be localized and the corrosion rate is small such that loss of rebar material will have no impact on the structural integrity of the walls. Thus an enhanced inspection is not required for the period of extended operation consistent with current licensing basis. However, the same area is inspected every refueling outage to assess the condition of the walls for elevated drywell temperature effects during the current term. This existing inspection in the Structures Monitoring Program (i.e., 2 year frequency vs the normal 4 year frequency) will continue for the period of extended operation and the walls will be observed for indication of rebar corrosion in addition to cracking.

References:
1. Letter, J. C. Devine, Jr. (GPUN) to NRC Oyster Creek Drywell Containment, dated December 5, 1990.
2. Letter, R. Keaton (GPUN) to NRC "Response to Request for Additional Information on Drywell Temperature (SEP Topic III-7.B)," dated November 19, 1993.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 12/29/2005

Reviewed By: Quintenz, Tom 1/11/2006

Approved By: Warfel, Don 1/11/2006

NRC Acceptance (Date):

NRC Information Request Form

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Item No		***Date Received:***	***Source***
AMR-170		10/31/2005	AMR Audit
Topic:		***Status:***	Closed

Expansion Joint in the Main Steam System

Document References:

3.5.1-1

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

Explain the reference to 3.5.1-1 in LRA Section 3.4 for the "expansion joint" in the Main Steam System.

Assigned To: Muggleston, Kevin

Response:

The Main Steam system "expansion joint" that references LRA Table 3.5.1 Item Number 3.5.1-1 consists of stainless steel expansion bellows welded to carbon steel pipe. Therefore it contains stainless steel material, carbon steel material and dissimilar metal welds. It was originally designed for 4000 cycles and is therefore subject to cumulative fatigue and TLAA review. This design is very similar to a penetration bellows. Because of this similarity, this component was matched with NUREG-1801 Volume 2 Item II.B4-4 (C-13), with reference to Standard Note "C" which states "Component is different, but consistent with NUREG-1801 item for material, environment and aging effect. AMP is consistent with NUREG-1801 AMP."

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Muggleston, Kevin	12/20/2005
Reviewed By:	May, Mike	12/20/2005
Approved By:	Warfel, Don	1/ 3/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-171

Date Received: 10/31/2005
Source AMR Audit

Status: Closed

Topic:
Loss of Material

Document References:
3.5.1-15

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

The Discussion indicates a larger scope for managing loss of material than the scope identified in the AMP description (B.1.33). Please clearly define the complete scope for which this AMP is credited, for managing loss of material.

Assigned To: Miller, Mark

Response:

LRA REQUIREMENTS:

LRA Table 3.5.1 Item Number 3.5.1-15 states: "The Protective Coating Monitoring and Maintenance Program, B.1.33 will be used to manage loss of material of internal surfaces of the primary containment steel elements, including the suppression chamber surfaces immersed in treated water, exterior surfaces of the vent lines, and on the exterior surfaces of the drywell in the former sand bed region. The program is in addition to ASME Section XI, Subsection IWE, 10 CFR Part 50 Appendix J, and TLAA, as applicable."

Structures and/or components and environments "rolled-up" into LRA Table 3.5.1 Item Number 3.5.1-15 include (reference LRA Table 3.5.2.1.1 for Primary Containment):
·Access Hatch Covers - Containment Atmosphere (Internal)
·Downcomers - Containment Atmosphere
·Drywell Penetration Sleeves - Containment Atmosphere (Internal)
·Drywell Shell - Containment Atmosphere (Internal) and Indoor Air (External)
·Personnel Airlock/Equipment Hatch - Containment Atmosphere (Internal)
·Suppression Chamber Penetrations - Containment Atmosphere (Internal)
·Suppression Chamber Ring Girders - Containment Atmosphere (External)
·Suppression Chamber Shell - Containment Atmosphere (Internal)
·Vent Line, and Vent Header - Containment Atmosphere (Internal) and Indoor Air (External)

Structures and/or components in immersed environments (non-GALL items) are also managed by the Protective Coating Monitoring and Maintenance Program, B.1.33 and include:

·Downcomers
·Suppression Chamber Ring Girders
·Suppression Chamber Penetrations
·Suppression Chamber Shell

AMP B.1.33 states: "The Protective Coating Monitoring and Maintenance Program provides for aging management of Service Level I coatings inside the primary containment and Service Level II coatings for the external drywell shell in the area of the sandbed region. Service Level I coatings are used in areas where the coating failure could adversely affect the operation of post-accident fluid systems and thereby impair safe shutdown." "Service Level II coatings provide corrosion protection and decontaminability in those areas outside of the primary containment that are subject to radiation exposure and radionuclide contamination. The Protective Coating Monitoring and Maintenance Program provides for visual inspections, assessment, and repairs for any condition that adversely affects the ability of Service Level I coatings, or sandbed region Service Level II coatings, to function as intended."

SERVICE LEVEL I COATING EVALUATION:

Not all Service Level I protective coatings inside the Primary Containment are credited for corrosion protection. Service Level 1 coatings are not credited for corrosion protection for the drywell shell above the sandbed region. ASME Section XI, Subsection IWE (B.1.27) and 10 CFR Part 50, Appendix J (B.1.29) are credited for managing loss of material in the drywell shell above the sandbed region during the period of extended operation. In addition, an analysis has been performed which demonstrates that the upper portion of the drywell vessel will meet ASME code requirements for the remaining life of the plant based on corrosion rates (reference UFSAR Section 3.8.2.8). The corrosion of the drywell shell above the sandbed region is considered a TLAA and is further described in LRA Section 4.7.2.

Service Level I coatings are credited for corrosion protection for the immersion zone of the torus, for torus internal structures, for downcomers, and for the vent system which previously had been thinned by corrosion and repaired (reference UFSAR Section 3.8.2.6.2 and Specification OCIS 328001-001). Although the air in the torus vapor space is replaced with nitrogen and the oxygen concentration is maintained below 4% during power operation, the Service Level I coating in the torus vapor space is credited for corrosion protection.

Based on the above discussions, the following clarification is provided. The Protective Coating Monitoring and Maintenance Program is not used to manage loss of material for the Drywell Shell and component types including Access Hatch Covers, Drywell Penetration Sleeves, and Personnel Airlock/Equipment Hatch exposed to a Containment Atmosphere (Internal) environment. Accordingly, LRA Table 3.5.2.1.1 for the Primary Containment will be revised to delete the Protective Coating Monitoring and Maintenance program (B.1.33) from these component types exposed to a containment atmosphere environment. Corrosion in the Drywell Shell, Access Hatch Covers, Drywell Penetration Sleeves, and Personnel Airlock/Equipment Hatch exposed to a Containment Atmosphere (Internal) environment is managed by the ASME Section XI, Subsection IWE (B.1.27) and the 10 CFR Part 50, Appendix J (B.1.29) aging management programs. The corrosion of the drywell shell

above the sandbed region is also considered a TLAA.

Although not credited for providing corrosion protection for the Drywell Shell, Access Hatch Covers, Drywell Penetration Sleeves, and Personnel Airlock/Equipment Hatch, the Protective Coating Monitoring and Maintenance Program is credited for maintaining the LOCA qualification of the coating for the Drywell Shell, Access Hatch Covers, Drywell Penetration Sleeves, and Personnel Airlock/Equipment Hatch. As discussed in the response to Audit Question AMP-006, and, as discussed in Program Basis Document PBD-AMP-B.1.33, all Service Level I coatings in the Drywell, Torus, and Vent System are qualified for a LOCA environment. Monitoring of Service Level I coatings to satisfy this requirement provides an added protection, though not required, against corrosion of the drywell shell.

SERVICE LEVEL II COATING EVALUATION:

Service Level II coatings are credited for corrosion protection for the external drywell shell in the area of the sandbed region only (e.g., Drywell Shell exposed to a Indoor Air (External) environment).

Based on the above discussions, the following clarification is provided. The Protective Coating Monitoring and Maintenance Program is not used to manage corrosion for the Vent Line, and Vent Header exposed to an Indoor Air (External) environment. Accordingly, LRA table 3.5.2.1.1 and Table 3.5.1 item 3.5.1-15 will be revised to delete the Protective Coating Monitoring and Maintenance program (B.1.33) from this component type exposed to an indoor air environment. Corrosion in the Vent Line and Vent Header exposed to an Indoor Air (External) environment is managed by the ASME Section XI, Subsection IWE (B.1.27) and the 10 CFR Part 50, Appendix J (B.1.29) aging management programs.

ATTACHMENTS:

1.UFSAR Section 3.8.2.8
2.UFSAR Section 3.8.2.6
3.Specification OCIS 328001-001, "Installation Specification for Torus Coating, Oyster Creek Nuclear Generating Station Pressure Suppression Chamber," Revision 0

LRCR #: 226 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 2/14/2006

Reviewed By: Ouaou, Ahmed 2/14/2006

Approved By: Warfel, Don 2/14/2006

NRC Acceptance (Date): 2/14/2006

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Item No
AMR-172

Date Received: 10/31/2005

Source AMR Audit

Status: Closed

Topic:
Structures AMR Table 2s

Document References:
3.5.1-31

NRC Representative Hoang, Dan

AmerGen (Took Issue):

Question

In the Structures AMR Table 2s, there are 19 references to Table 1 Item Number 3.3.1-46, all covering change in material properties of elastomer seals. The SMP is credited for aging management, and Note E is identified. Please clarify why these Table 2 line items do not reference Table 1 Item Number 3.5.1-31.

Assigned To: Ouaou, Ahmed

Response:

As noted in the discussion column of Table 1 Item Number 3.5.1-31, there are no Table 2 Item Numbers in the January 2005 Draft NUREG 1801, Vol 2 that roll up to this Item number. The January Draft NUREG-1801 Vol 1, Table 5 indicates that TP-7 rolls up to ID Number 31 which corresponds to Oyster Creek Table 1 Item Number 3.5.1-31. However TP-7 did not exist in the January 2005 Draft NUREG-1801 Vol, 2, Section III Table 2. As a result, we referenced Table 1 Item Number 3.3.1-46 instead of Item Number 3.5.1-31.

Note: TP-7 has been added as a new line item number (III.A6-12) to NUREG-1801 Vol. 2 Rev.1 issued in September 2005.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 12/21/2005

Reviewed By: Muggleston, Kevin 1/ 3/2006

Approved By: Warfel, Don 1/ 3/2006

NRC Acceptance (Date):

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Item No
AMR-173

Date Received: 10/31/2005

Source AMR Audit

Status: Closed

Topic:
Lock-Up Due to Wear for Radial Beams

Document References:
3.5.1-32

NRC Representative Hoang, Dan

AmerGen (Took Issue):

Question

The aging effect Lock-up due to wear is a concern whether or not Lubrite plates are used to provide a sliding surface. Please submit the AMR for lock-up due to wear for the radial beams. Describe the design features that permit free movement of the radial beams, and identify the aging management activities that ensure this intended function for the extended period of operation.

Assigned To: Ouaou, Ahmed

Response:

There are two main steel framing floors inside the containment drywell. One at elevation 44'-3" and the other at elevation 23'-6". The radial beams for elevation 44'-3" are supported on posts connected to the reactor pedestal and reactor shield wall on one side and hang from steel welded to the drywell shell on the other side. The hanger is provided with a pin that allows movement of the radial beam. The radial beams on this elevation are not supported directly from the drywell shell.

Radial beams at elevation 23'-6" are supported from brackets connected to the reactor pedestal on one side and from brackets connected to the drywell shell on the other side. The bracket on the drywell shell side is provided with a 5"x3/4"x10" Lubrite plate which permits movement of the radial beam.

These components are included in the component type "Structural Steel (radial beams, posts, bracing, plate, connections, etc.) listed in Table 3.5.2.1.1, page 3.5-61 and inspected for loss of material, under the Structures Monitoring Program (B.1.31).
Industry and plant operating experience, and information gathered from vendors indicate that lock up due to wear for Lubrite plates is not significant due to outstanding material properties, relatively low cycle application, and lack of industry experience on failures. Although no aging management is required, the support brackets which incorporate the use of Lubrite are monitored under the Structures Monitoring Program as indicated above.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

NRC Information Request Form

Approvals:

Prepared By:	Ouaou, Ahmed	12/21/2005
Reviewed By:	Muggleston, Kevin	1/ 5/2006
Approved By:	Warfel, Don	1/ 6/2006
NRC Acceptance (Date):		

NRC Information Request Form

Item No
AMR-174

Date Received: 10/31/2005

Source AMR Audit

Status: Closed

Topic:
Stainless/Galvanize Steel Supports Loss of Mech. Function

Document References:
3.5.1-34

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

Are there any Group B.1, B.2, B.3 stainless steel and/or galvanized steel supports for which loss of mechanical function is an applicable aging effect? If so, are these supports included in the scope covered by Item Number 3.5.1-37, and subject to aging management under IWF?

Assigned To: Muggleston, Kevin

Response:

Loss of Mechanical Function applies to mechanical components associated with support designs that undergo controlled mechanical movement to perform their intended function, such as constant and variable load spring hangers, guides, stops, and sliding surfaces, and associated design clearances. At Oyster Creek, these Group B1, B2 and B3 support components are fabricated from carbon and low alloy steel and Lubrite. Therefore, there are no Group B1, B2 or B3 stainless steel or galvanized steel supports for which Loss of Mechanical Function is an applicable aging effect.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 12/21/2005

Reviewed By: Ouaou, Ahmed 1/ 3/2006

Approved By: Warfel, Don 1/ 3/2006

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NRC Information Request Form

Item No		***Date Received:***	***Source***
AMR-175		10/31/2005	AMR Audit
		Status:	Closed

Topic:
Stainless/Galvanize Steel Supports Loss of Mech. Function

Document References:
3.5.1-37

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

<u>Question</u>

Are there any Group B.1, B.2, B.3 stainless steel and/or galvanized steel supports for which loss of mechanical function is an applicable aging effect? If so, are these supports included in the scope covered by Item Number 3.5.1-37, and subject to aging management under IWF? (same question as 3.5.1-34 above)

Assigned To: Muggleston, Kevin

<u>Response:</u>

Loss of Mechanical Function applies to mechanical components associated with support designs that undergo controlled mechanical movement to perform their intended function, such as constant and variable load spring hangers, guides, stops, and sliding surfaces, and associated design clearances. At Oyster Creek, these Group B1, B2 and B3 support components are fabricated from carbon and low alloy steel and Lubrite. Therefore, there are no Group B1, B2 or B3 stainless steel or galvanized steel supports for which Loss of Mechanical Function is an applicable aging effect.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

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Approved By:	Warfel, Don	1/ 3/2006

NRC Acceptance (Date):

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Status: Closed

Topic:
Bolting Materials Used in Structural Applications

Document References:
3.5.1-38

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

More information is needed about bolting materials used in structural applications at OCGS, including Group B1.1 applications. What are the bolting materials used? What are the nominal yield strengths and upper-bound as-received yield strengths? Describe the OCGS resolution of the bolting integrity generic issue, as it relates to structural bolting. Was any structural bolting identified as potentially susceptible to cracking due to SCC? Was any structural bolting replaced as part of the resolution?

Assigned To: Ouaou, Ahmed

Response:

Response:
More information is needed about bolting materials used in structural applications at OCNGS, including Group B1.1 applications.

a) What are the bolting materials used?
Response:
The review of plant design drawings, specifications, and NRC correspondence indicates that ASTM A-307, A-325, A-193 Gr.B7, A-193 Grade B8M, and A-490 bolts were used in structural applications. The ASME Class 1 piping and component supports (Group B1.1), other than reactor vessel skirt support bolts, were furnished by Grinnell Corporation and identified on the hanger drawings as (H.S.) without material designation. These were assumed to be A-193 Grade B7 or equivalent based on compatability with Grinnell materials and support standards. The bolts for the reactor vessel skirt support are indicated as ASTM A-325 on the drawings.

b) What are the nominal yield strengths and upper bound as-received yield strengths?
Response:
In response to IE Bulletin 87-02, GPU performed chemical, hardness, and physical testing on sample of safety and non-safety related bolting and transmitted the results to NRC (Ref. 1). The test results for yield strengths are shown below:

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Bolt Material	Nominal Yield (PSI)	Actual Yield (PSI)
A-193 Gr B7	105,000	121,212
	105,000	140,000
	105,000	139,030
	105,000	132,113
	105,000	127,858
	105,000	125,418
	105,000	151,960*
	105,000	122,646
	105,000	128,318
	105,000	129,081
	105,000	117,617
	105,000	107,601
A-193 Gr B8M	30,000	67,961
	30,000	84,577
	30,000	84,210
	30,000	86,248
	30,000	63,157
A-193 Gr B8	30,000	85,539
A-193 Gr B8	30,000	96,938
A-307	36,000	Not tested
A-325	81,000	127,842
A-490	130,000	See Below

*This test sample is not used in structural applications.

Since the response to the bulletin was provided, a review of the stocking of A-490 bolting was performed. Based on the history of stocking of A-490 bolting, it was determined bolts of this material were installed as part of a modification in the year 2000. These bolts were procured in accordance with the established specifications and installed as part of the Reactor Building Single Failure Proof Crane Modification. The 7/8 inch diameter bolts were installed to secure a new stiffener clip between the reactor building superstructure column and the Reactor Building Crane Rail Beam. The bolting was installed to snug tight thus not subject to high prelaod.

c) Describe the OCGS resolution of the bolting integrity generic issue, as it relates to structural bolting.
Response:
Oyster Creek implemented the following actions to resolve the bolting integrity generic issue:

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1. In response to IE Bulletin 87-02, "Fastener testing to determine conformance with applicable material specifications", GPU performed chemical, hardness, and physical testing on a sample of safety and non-safety related bolting to determine material conformance and transmitted the results to NRC (Ref. 1).
2. In response to IE Bulletin 87-02, Supplement 1, GPU performed an extensive review of the Supplier Quality Classification List (SQCL) and Contractor Classification List (CCL) and submitted the result to NRC (Ref. 2).
3. Oyster Creek established procedures that are based on the guidance and recommendations provided in NUREG-1339, "Resolution of Generic Safety Issue 29: Bolting Degradation of Failure in Nuclear Power Plants", EPRI NP-5769,"Degradation and Failure of Bolting in Nuclear Power Plants", and EPRI 5067, "Good Bolting Practices". These include,

All safety related fasteners are bought from vendors on GPUN QA approved vendor's list.

Fasteners are subject to receipt inspections designed to identify substandard/fraudulent items. Suspect bolts are tested before they are released for use.

Approved lubricants are controlled by procedures. The primary lubricant at Oyster Creek is Chesterton, a nickel based lubricant that does not contain Molybdenum sulfate (MoS2).

Installation procedures provide instructions for proper tightening of bolted connections.

d) Was any structural bolting identified as potentially susceptible to cracking due to SCC?

Response:
No. The reviewed documentation on the resolution of the generic bolting issue did not identify any structural bolting that is potentially susceptible to cracking due SCC.

e) Was any structural bolting replaced as part of the resolution?
Response:
No. The reviewed documentation on the resolution of the generic bolting issue did not identify any instances where structural bolting was replaced to resolve the bolting issue.

Reference:
1. Letter from P. B. Fiedler (GPU) to W. T. Russell (NRC), "Response to NRC Compliance Bulletin 87-02; Faster Testing to Determine Material Conformance", dated February 26, 1988.
2. Letter from E. E. Fitzpatrick (GPU), "GPUN Response to Bulletin 87-02, dated February 26, 1988, NRC Bulletin 87-02, Supplement 1", dated July 25, 1988.
3. NUREG-1339, "Resolution of Generic Safety Issue 29: Bolting Degradation or Failure in Nuclear Power Plants", June 1990.
4. Generic Letter 91-71, Generic Safety Issue 29, "Bolting Degradation or Failure in Nuclear in Nuclear Power Plants".
5. EPRI NP-5769, "Degradation and Failure of Bolting in Nuclear Power Plants", Volume 1 & Volume 2, April 1988.

NRC Information Request Form

6. EPRI NP-5067, "Good Bolting Practices", Volume 1 & Volume 2, December 1990.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 2/16/2006

Reviewed By: Quintenz, Tom 2/16/2006

Approved By: Warfel, Don

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-177

Date Received: 12/20/2005

Source AMR Audit

Status: Closed

Topic:
Structural Steel and Aluminum in "Concrete" Environment

Document References:
Tables 3.5.2.1.1 - 3.5.2.1.19

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

What is the plant-specific operating experience for structural steel (SS, carbon and alloy, galvanized) and aluminum in a "concrete" environment? Have there been any occurrences of degradation? If yes, why is no aging management program credited for LR? (3.3.1-78)

Assigned To: Muggleston, Kevin

Response:

The Oyster Creek plant-specific operating experience was reviewed for occurrences of steel (stainless steel, carbon and alloy steel, galvanized steel) and aluminum degradation in a concrete environment. No occurrences of stainless steel, galvanized steel or aluminum degradation in concrete were identified. Oyster Creek has experienced corrosion of carbon steel embedded in concrete (embedments, rebar), but the identified corrosion was not attributed to steel exposure to the concrete environment. The corrosion occurred as a result of the steel becoming exposed to air or water due to concrete deterioration.

Oyster Creek will evaluate inaccessible areas of steel embedded in concrete, and perform inspections as required, if observed conditions in accessible areas indicate that the steel embedded in the concrete is experiencing significant corrosion.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/14/2006

Reviewed By: Ouaou, Ahmed 2/14/2006

Approved By: Warfel, Don

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMR-178		12/20/2005	AMR Audit
Topic:		***Status:***	Closed

Steel and Aluminum in "Indoor Air" Environment

Document References:
Tables 3.5.2.1.1 - 3.5.2.1.19

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

What is the plant-specific operating experience for structural SS, galvanized steel, and aluminum in an "indoor air" environment? Have there been any occurrences of degradation? If yes, why is no aging management program credited for LR? (3.3.1-76, 3.3.1-74, 3.2.1-32)

Assigned To: Muggleston, Kevin

Response:

The Oyster Creek plant-specific operating experience was reviewed for occurrences of stainless steel, galvanized steel and aluminum degradation in an indoor air environment. No occurrences of stainless steel, galvanized steel or aluminum degradation in an indoor air environment were identified.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Muggleston, Kevin	12/16/2005
Reviewed By:	Ouaou, Ahmed	1/ 3/2006
Approved By:	Warfel, Don	1/ 3/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMR-179		12/20/2005	AMR Audit
Topic:		***Status:***	Closed

Steel and Alumuminum in "Containment Atmosphere" Environment

Document References:
Tables 3.5.2.1.1 - 3.5.2.1.19

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

What is the plant-specific operating experience for structrual SS, galvanized steel, and aluminum in a "containment atmosphere" environment? Have there been any occurrences of degradation? If yes, why is no aging management program credited for LR? (3.3.1-76, 3.3.1-74)

Assigned To: Muggleston, Kevin

Response:

The Oyster Creek plant-specific operating experience was reviewed for occurrences of stainless steel, galvanized steel and aluminum degradation in a containment atmosphere environment. No occurrences of stainless steel, galvanized steel or aluminum degradation in a containment atmosphere environment were identified.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Muggleston, Kevin	12/16/2005
Reviewed By:	Ouaou, Ahmed	1/ 3/2006
Approved By:	Warfel, Don	1/ 3/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMR-180		12/20/2005	AMR Audit
Topic:		***Status:***	Closed
Structural Bolting AMR - Loss of Preload			

Document References:
Tables 3.5.2.1.1 - 3.5.2.1.19

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

For structural bolting, describe the AMR. How is "loss of preload" managed? (3.3.1-35, 3.3.1-36)

Assigned To: Muggleston, Kevin

Response:

Structural bolting applications at Oyster Creek do not require specific predetermined bolting preload to assure the associated structural intended functions are maintained. Structural bolting is assembled using approved bolting materials and lubricants. Bolted connections are assembled using vendor recommended methods, turn-of-the-nut methods, or standard torque values for the applicable bolt size and material. For structural bolting, loss of preload will not impact the bolted connection intended function unless the bolts become loose such that the integrity and geometry of the bolted connection is affected. This aging effect is managed by visual inspection for loose or missing nuts and bolts.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/14/2006

Reviewed By: Ouaou, Ahmed

Approved By: Warfel, Don 2/16/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMR-181		12/20/2005	AMR Audit
		Status:	Closed

Topic:
Elastomer Seals AMR; Fire Barrier Seals

Document References:
Tables 3.5.2.1.1 - 3.5.2.1.19

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

<u>Question</u>

For elastomer seals, describe the AMR. Are fire barrier seals included in the structures scope? (3.3.1-46)

Assigned To: Muggleston, Kevin

<u>Response:</u>

Elastomer seals are in the scope of the Structures Monitoring Program, and are inspected for indications of change in material properties by visually inspecting the elastomer material for indication of cracking and hardening. Fire barrier seals are not included in the scope of the Structures Monitoring Program. Fire barrier seals are included in the Fire Protection aging management program.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By:	Muggleston, Kevin	12/16/2005
Reviewed By:	Ouaou, Ahmed	1/ 3/2006
Approved By:	Warfel, Don	1/ 3/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-182

Date Received: 12/20/2005

Source AMR Audit

Topic:
Class MC Pressure Retaining Bolting AMR and Loss of Preload

Status: Closed

Document References:
Tables 3.5.2.1.1

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

Describe the scope and AMR for Class MC Pressure Retaining Bolting. How is loss of preload managed? (3.2.1-25)

Assigned To: Muggleston, Kevin

Response:

The aging management programs credited for aging management of Class MC Pressure Retaining Bolting are the ASME Section XI, Subsection IWE (B.1.27) aging management program, and the 10 CFR Part 50, Appendix J (B.1.29) aging management program. The ASME Section XI, Subsection IWE aging management program is credited to manage the Loss of Material aging effect, and the 10 CFR Part 50, Appendix J aging management program is credited to manage the Loss of Preload aging effect. The 10 CFR Part 50, Appendix J aging management program credits the Primary Containment Leakage Rate Testing Program to provide for aging management of pressure boundary degradation and loss of leak tightness due to aging effects including loss of preload in the Class MC Pressure Retaining Bolting associated with Primary Containment.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/14/2006

Reviewed By: Ouaou, Ahmed

Approved By: Warfel, Don

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-183

Date Received: 12/20/2005
Source AMR Audit
Status: Closed

Topic:
Reinforced Concrete Foundation and Wall Environments

Document References:
Table 3.5.2.1.9

NRC Representative Hoang, Dan

AmerGen (Took Issue):

Question

Describe the "aggressive environment" and "water-flowing" environments for Reinforced Concrete Foundation and Reinforced Concrete Walls. Describe the AMR. What is the plant-specific program to manage prtential degradation?

Assigned To: Ouaou, Ahmed

Response:

The "aggressive environment" and "water-flowing" environments are only applicable to the freshwater pump house, the Service Water System (SWS) Seal Well, the intake structure, and the dilution structure. Other Oyster Creek structures in scope of license renewal are not exposed to "aggressive environment" because ground water in the vicinity of their foundations is not aggressive (pH = 6.4, Chlorides = 138, Sulfates = 73; pH = 5.6, Chlorides = 3, Sulfates = 7). See response to Audit Question #AMP-168 for more details on groundwater testing results.

The "aggressive environment" and "water-flowing" environments for the freshwater pump house was addressed in response to Question #AMP-166.

The "aggressive environment" and "water-flowing" environments for the SWS Seal Well was addressed in response to Audit Question #AMP-166, and Audit Question #AMP-184.

The response to this questions addresses "aggressive environment" and "water-flowing" environments as they pertain to the intake structure and the dilution structure.

The intake structure and the dilution structure are subject to "Raw Water - Salt Water" environment described in LRA Table 3.0-2. The environment is aggressive (pH = 7.9, chlorides = 14,659 ppm, and sulfates = 1,419 ppm) because the chloride limit specified in NUREG-1801 (< 500 ppm) is exceeded. The two structures are considered water-control structures and subject to inspections conducted in accordance with Oyster Creek RG. 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.32) aging management program.

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The Oyster Creek RG. 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants (B.1.32) requires visual inspection of accessible areas of the structures. Under the current term, Inaccessible areas including underwater portions of the structures are inspected when they become accessible. For license renewal, Oyster Creek committed to perform periodic inspections of the submerged portions of the structures as described in LRA Appendix B.1.32 and as modified by the response to Audit Question #AMP-077. In response to Audit Question #AMP-166, Oyster Creek clarified that inaccessible areas will be inspected if exposed by excavation for any reason, and if observed conditions in accessible areas, which are exposed to the same environment, show that significant concrete degradation is occurring.

Inspection activities will be conducted underwater, unless the structures are de-watered for any reason. Components monitored will include accessible portions of reinforced concrete walls, and the foundation slab. Parameters monitored will include loss of material due to various concrete aging mechanisms, including erosion due to water-flowing environment, cracking, and change in material properties due to the aggressive environment and leaching of calcium hydroxide. The initial inspection will be conducted prior to entering the period of extended operation.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 1/12/2006

Reviewed By: Muggleston, Kevin 1/12/2006

Approved By: Warfel, Don

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-184

Date Received: 12/20/2005

Source AMR Audit

Status: Closed

Topic:
Reinforced Concrete Wall and Slab Environments

Document References:
Table 3.5.2.1.12

NRC Representative Hoang, Dan

AmerGen (Took Issue):

Question

Describe the "aggressive environment" and "water-flowing" environments for Reinforced Concrete Walls, Slabs (SWS Seal Well). Descirbe the AMR. What is the plant-specifi program to manage potential degradation?

Assigned To: Ouaou, Ahmed

Response:

The Service Water system (SWS) Seal Well is a reinforced concrete 2-cell junction box, partly above ground, that is in the flow path of the service water system return line to the discharge canal. The 2 cells are separated by a 4-foot high concrete wall that acts as a weir over which water discharged from SWS line overflows and drains out through a 30" diameter drain at bottom of the second cell. The drain line is connected to the Roof Drains and Overboard Discharge system (Section 2.3.3.33) which coveys water to the discharge canal. The weir overflow was considered "water-flowing" environment. Also, see response to Audit Question No. AMP-166, and No. AMP-183.

The internal surfaces of the junction box are subject to "Raw Water-Salt Water" environment described in LRA Table 3.0-2. The environment is considered aggressive (pH = 7.9, chlorides = 14,659 ppm, and sulfates = 1,419 ppm) because the chlorides limit specified in NUREG-1801 (<500 ppm) is exceeded.

The SWS Seal Well is not currently monitored under the Structures Monitoring Program (B.1.31). There is documented evidence that the SWS Seal Well has been inspected previously in October 1999. As a result of this inspection there are records indicating that the interior surfaces of the structure were coated with an elastomer to protect against concrete degradation. The coating, however, is not monitored on regular basis such that it could be credited for managing aging effects of concrete.

Observed exterior surfaces of the above ground structure that are exposed to the water-flowing and aggressive Raw Water-Salt Water environment described above on internal surfaces, shows rust stains and cracking. However the structure appears acceptable. An Issue Report (IR) was issued in

accordance with the corrective action process to determine why the structure is not in scope of the Maintenance Rule Structures Monitoring Program, and to evaluate its condition for the current term.

As indicated in LRA Table 3.5.2.1.12, the SWS Seal Well will be monitored under the Structures Monitoring Program (B.1.31). Inspection frequency will be every 4 years. The initial inspection will be completed prior to entering the period of extended operation. The results of this inspection will be evaluated to determine if any corrective actions are required or if more frequent inspections are warranted to ensure that the intended function of the structures is maintained.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 1/26/2006

Reviewed By: Muggleston, Kevin 1/26/2006

Approved By: Warfel, Don

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-185

Date Received: 12/20/2005

Source AMR Audit

Status: Closed

Topic:
SS, Galvanized Steel, & Aluminum AMR

Document References:
Table 3.5.2.1.18

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

For Stainless Steel, Galvanized Steel, and Aluminum ASME Class 1, 2, 3 and MC Supports, describe the AMR. Why is loss of mechanical function not identified as an aging effect for these materials? (3.5.1-37)

Assigned To: Muggleston, Kevin

Response:

There are no aluminum ASME Class 1, 2, 3 and MC supports at Oyster Creek. The stainless steel and galvanized steel ASME Class 1, 2, 3 and MC supports at Oyster Creek that are located in an Indoor Air or Containment Atmosphere environment do not experience aging effects that require aging management. There are ASME Class 2, 3 and MC supports located in a Treated Water (<140°F) environment that are subject to Loss of Material due to pitting and crevice corrosion. The Loss of Material aging effect for these supports is managed by the Water Chemistry aging management program. The effectiveness of the Water Chemistry program is verified by periodic inspections performed under the ASME Section XI, Subsection IWF aging management program. See LRA Table 3.3.1 Item 3.3.1-22.

Loss of Mechanical Function applies to mechanical components associated with support designs that undergo controlled mechanical movement to perform their intended function, such as constant and variable load spring hangers, guides, stops, and sliding surfaces, and associated design clearances. At Oyster Creek, these support components are fabricated from carbon and low alloy steel and Lubrite. Therefore, there are no stainless steel, galvanized steel, and aluminum ASME Class 1, 2, 3 and MC support components for which Loss of Mechanical Function is an applicable aging effect.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Muggleston, Kevin 12/22/2005

NRC Information Request Form

Reviewed By: Ouaou, Ahmed 1/ 3/2006

Approved By: Warfel, Don 2/16/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-227

Date Received: 1/25/2006

Source AMR Audit

Status: Closed

Topic:
GALL AMP

Document References:
X1-E4 E5 E6

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

Provide basis to show that why these programs are not required or applicable to OCNGS.

Assigned To: Spamer, Deb

Response:

Per section 2.5.2.3 of the Oyster Creek LRA, Oyster Creek does not have an XI.E4 aging management program for metal enclosed bus because there is no metal enclosed bus at Oyster Creek that is within the scope of license renewal.

Per section 3.6.2.3.1 of the Oyster Creek LRA, Oyster Creek does not have an XI.E5 aging management program for fuse holders because no stressors are identified for Oyster Creek fuse holders that require aging management.

Per section 3.6.2.3.3 of the Oyster Creel LRA, Oyster Creek does not have an XI.E6 aging management program for cable connections, metallic parts because no stressors are identified for Oyster Creek cable connection metallic parts that require aging management.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Spamer, Deb 1/26/2005

Reviewed By: Corsi, Lou 1/26/2006

Approved By: Polaski, Fred 1/26/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-228

Date Received: 1/25/2006

Source AMR Audit

Topic:
GALL AMPS

Status: Closed

Document References:
X1-E4 E5 E6

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

GALL AMP X1- E4 (Metal enclosed bus) is identified as the aging management program for metal enclosed buses associated with FRCT and the switchyard connections. How are the aging effects (cracked bus sleeving, moisture, debris, loosening of bolted connection etc.) of metal enclosed buses at OCNGS under the scope of license renewal are monitored and managed?

Assigned To: Spamer, Deb

Response:

Per the AmerGen response to RAI 2.5.1.19-1, we concur that there is metal enclosed phase bus at the Forked River Combustion power plant that will be visually inspected under aging management program B.1.37. Unlike the Forked River Combustion Turbine power plant, there are no metal enclosed bus within the scope of license renewal at Oyster Creek. This is documented in section 2.5.2.3 of the Oyster Creek LRA.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 1/26/2006

Reviewed By: Corsi, Lou 1/26/2006

Approved By: Polaski, Fred 1/26/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-236

Date Received: 1/25/2006

Source AMR Audit

Status: Closed

Topic:
Structures Monitoring Program

Document References:
B.1.31

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

P. 20 of the PBD lists an enhancement (10 yr inspection frequency for underwater structures) which is inconsistent with a new commitment identified in B.1.32 for underwater water-control structures. The B.1.31 enhancement should be consistent with the new B.1.32 commitment.

Assigned To: Ouaou, Ahmed

Response:

PBD-AMP-B.1.31 will be revised to add the inspection frequency for submerged water control structures as described in PBD-AMP-B.1.32, Section 2.4 Summary of Enhancements.

PBD-AMP-B.1.32, Section 2.4 Summary of Enhancements states - "The program will be enhanced to require performing a baseline inspection of submerged water control structures prior to entering the period of extended operation. A second inspection will be performed 6 years after this baseline inspection and a third 8 years after the second. After each inspection an evaluation will be performed to determine if the identified degradations warrant more frequent inspections or corrective actions."

LRCR #: 254 *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Beck, George 1/26/2006

Reviewed By: Ouaou, Ahmed 1/26/2006

Approved By: Warfel, Don 1/30/2006

NRC Acceptance (Date): 1/27/2006

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMR-237		1/25/2006	AMR Audit
Topic:		***Status:***	Closed
Mechanical Systems			

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

Question GM-1
Based on review of the Table 2s for Sections 3.1 through 3.4, the following AMPs are credited to manage cracking initiation and growth:
·□10 CFR Part 50, Appendix J (B.1.29)
·□ASME Section XI, Subsection IWE (B.1.27)
·□ASME Section XI, Subsection IWB/IWC/IWD (B.1.1)
·□One-Time Inspection (B.1.24)
·□Bolting Integrity (B.1.12)
·□BWR Reactor Water Cleanup System (B.1.18)

For each AMP, describe the inspections that will be conducted to detect cracking initiation and growth, and provide the technical basis for concluding that the methods employed are adequate.

Assigned To: Muggleston, Kevin

Response:

10 CFR Part 50, Appendix J (B.1.29):

The 10CFR50 Appendix J program conducts tests to assure that (a) leakage through the primary reactor containment and systems and components penetrating primary containment shall not exceed allowable leakage rate values as specified in the technical specifications or associated bases, and (b) periodic surveillance of reactor containment penetrations and isolation valves is performed so that proper maintenance and repairs are made during the service life of the containment, and systems and components penetrating primary containment.

The Primary Containment Leakage Rate Testing Program (LRT) provides for aging management of pressure boundary degradation and loss of leak tightness due to aging effects, including cracking, in various systems penetrating primary containment. This program is being credited for aging management of containment isolation barrier piping, valves, and components that constitute a potential primary containment atmospheric pathway during or following a design basis accident

(DBA), when used in conjunction with the ASME Section XI, Subsection IWE program (B.1.27).

Type A, or Integrated Leak Rate Tests (ILRTs), measure overall primary containment leakage as a whole. Type B, or Local Leak Rate Tests (LLRTs), are performed to measure local leakage rates across each pressure-containing or leakage-limiting boundary for the primary containment isolation system containment penetrations. The primary containment LRT program detects degradation, including cracking, of the containment, piping, and components, that compromise the containment pressure boundary through the use of pressure tests to verify the pressure retaining integrity of the containment. Calculation of leakage rates demonstrates the leak-tightness and structural integrity of the containment. The primary containment leakage testing program is repeated throughout the operating license period, therefore the entire primary containment pressure boundary is being monitored and trended over time. When used in conjunction with the containment inservice inspection program described by the ASME Section XI, Subsection IWE program, this program is used to assist in the detection of cracking initiation and growth.

For more information concerning the 10CFR50 Appendix J program, see PBD-AMP-B.1.29.

ASME Section XI, Subsection IWE (B.1.27):

The Oyster Creek ASME Section XI, Subsection IWE aging management program implements the requirements of IWE by providing General, VT-1, and VT-3 visual examinations and augmented inspections for evidence of aging effects that could affect structural integrity or leak tightness of the primary containment.

The Oyster Creek ASME Section XI, Subsection IWE aging management program addresses the examination categories described in Table IWE-2500-1 which are the same as those described in NUREG-1801.

Oyster Creek elected not to implement the weld examination requirement for Code Categories E-B and E-F as allowed by 10 CFR 50.55a(b)(2)(ix)(C). However, the weld examinations are included in Categories E-A as accessible surface area inspections.

The Oyster Creek ASME Section XI, Subsection IWE aging management program specifies examinations of accessible surfaces to detect the aging effects of loss of material, crack initiation and growth, loss of preload, loss of sealing, and fretting or lockup as addressed in IWE-3500. Loss of material, fretting or lockup is monitored by general visual, visual VT-3, Visual VT-1 as described above. Crack initiation and growth of stainless bellows and Containment Vacuum Breaker system expansion joints, piping and valve bodies, and loss of sealing of airlocks, seals, and gaskets are managed by 10 CFR Part 50, Appendix J. Crack initiation and growth for pressure retaining dissimilar welds is by surface examination.

For more information concerning the ASME Section XI, Subsection IWE, see PBD-AMP-B.1.27.

ASME Section XI, Subsection IWB/IWC/IWD (B.1.1):

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The Oyster Creek ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD aging management program provides for:

Cracking monitoring for susceptible reactor vessel components subject to a steam or reactor water environment, through visual inspections using the examination and inspection requirements specified in ASME Section XI, Table IWB-2500-1.

Cracking monitoring for susceptible reactor internal attachments and ASME Class 1 components subject to a steam or reactor water environment, through surface and volumetric examinations of pressure retaining welds and their heat affected zones in piping components by using the examination and inspection requirements specified in ASME Section XI, Table IWB-2500-1.

Cracking monitoring of the areas of the Oyster Creek isolation condensers subject to a steam or water environment, through surface and volumetric examinations of pressure retaining nozzle welds in vessels and their heat affected zones by using the examination and inspection requirements specified in ASME Section XI, Table IWC-2500-1 for the tube side and IWD-2500-1 for the shell side.

Examples of examination categories in the inservice inspection tables include:

The Oyster Creek ISI program plan Category B-F calls for volumetric and surface exams of pressure retaining dissimilar metal welds in 4 inch NPS and larger piping and surface exams in piping less than 4 inch NPS per the Oyster Creek ISI program plan tables.

ISI program plan Category B-J calls for volumetric and surface exams of pressure retaining welds in 4 inch NPS and larger piping and surface exams in piping less than 4 inch NPS and also socket welds per the Oyster Creek ISI program plan tables.

ISI Program Plan Category C-A specifies volumetric examination of tubesheet-to-head welds of the isolation condenser per the Oyster Creek ISI program plan tables.

ISI Program Plan Category C-B specifies volumetric and surface examination of nozzle-to-shell (or head) welds of the isolation condenser per the Oyster Creek ISI program plan tables.

For more information concerning the Oyster Creek ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD aging management program, see PBD-AMP-B.1.01.

One-Time Inspection (B.1.24):

The One-Time Inspection aging management program is used to confirm crack initiation and growth is not occurring in stainless and carbon steel Class 1 piping with a diameter less than four inch NPS exposed to a reactor coolant environment (treated water or steam). The program inspects areas susceptible to stress corrosion cracking, intergranular stress corrosion cracking, or thermal and mechanical loading. Qualified personnel following station procedures that are based on applicable codes and standards, including ASME, and 10 CFR 50, Appendix B, will perform inspections. In accordance with GALL program XI.M32 Element 4 "Detection of Aging Effects," examination will be

by volumetric (UT) examination. As discussed in NRC Bulletin No. 88-08, Supplement 2, a UT procedure that has been shown to be capable of detecting and sizing intergranular stress corrosion cracking has been demonstrated to be effective in detecting thermal fatigue cracks, therefore, a single UT inspection will be capable of detecting cracking initiation and growth due to both stress corrosion cracking and thermal fatigue.

The One-Time Inspection aging management program is used to confirm the effectiveness of the Water Chemistry program, B.1.2, to manage crack initiation and growth in stainless steel exposed to treated water > 140 deg F, steam, and sodium pentaborate environments. The program will inspect areas susceptible to stress corrosion cracking and intergranular stress corrosion cracking. Qualified personnel following station procedures that are based on applicable codes and standards, including ASME, and 10 CFR 50, Appendix B, will perform inspections. In accordance with GALL program XI.M32 Element 4 "Detection of Aging Effects," examination will be by volumetric (UT) examination.

For more information concerning the One-Time Inspection program, see PBD-AMP-B.1.24 and the One-Time Inspection Sample Basis document for the Oyster Creek License Renewal Project dated 08/16/2005.

Bolting Integrity (B.1.12):

The only components in the scope of this program that are subject to crack initiation and growth are the high strength bolts installed on the Control Rod Drive flanges. As part of the Bolting Integrity aging management program, these bolts are subject to visual (VT-1) surface examination in accordance with ASME Section XI, Subsection IWB-2500 Examination Category B-G-2. These bolts are subject to VT-1 inspection during CRD maintenance activities, prior to the bolts being reinstalled. Acceptance standards are in accordance with ASME Section XI, Subsection IWB-3517.

General Electric has changed the design of the CRD flange bolts since initial Oyster Creek construction. When CRDs are removed for maintenance, any old-style bolts are replaced with the new design. A representative sample of old-style bolts is cleaned and inspected for evidence of cracking using PT techniques, prior to being discarded. These inspections provide confirmation that the old-style bolts that remain in service are not degraded and do not require immediate replacement.

For more information concerning the Bolting Integrity program, see PBD-AMP-B.1.12.

BWR Reactor Water Cleanup System (B.1.18):

The BWR Reactor Water Cleanup System program describes the requirements for augmented inservice inspection (ISI) for stress corrosion cracking (SCC) or intergranular stress corrosion cracking (IGSCC) on stainless steel Reactor Water Cleanup System piping welds outboard of the second isolation valve. The program includes inspection guidelines delineated in NUREG 0313, Rev. 2 and NRC Generic Letter (GL) 88 01 and includes the alternate measures approved by the NRC in BWRVIP 75 "BWR Vessel and Internals Project Technical Basis for Revisions to Generic Letter 88 01 Inspection Schedules." The program also provides for water chemistry control in accordance with EPRI BWRVIP 130: "BWR Vessel and Internals Project BWR Water Chemistry Guidelines" to

minimize the potential of crack initiation and growth due to SCC or IGSCC.
In accordance with Generic Letter (GL) 88 01, Supplement 1, upgrades and enhancements have been implemented to the RWCU isolation valves in accordance with Generic Letter 89 10 to ensure that the valves will produce sufficient thrust to perform their design basis function, which is the isolation of containment in the event of a pipe break downstream of the valves. Based on these upgrades/enhancements, an effective Hydrogen Water Chemistry program, and the complete lack of cracking found during any of the RWCU piping weld inspections under Generic Letter 88 01, all inspection requirements for the portion of the RWCU System outboard of the second containment isolation valves have been eliminated. Based on meeting all three criteria specified in GALL program XI.M25 Element 1 "Scope of Program" as described above, inspections of RWCU piping welds outboard of the second isolation valve are not required.

For more information concerning the BWR Reactor Water Cleanup System program, see PBD-AMP-B.1.18.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/15/2006

Reviewed By: Miller, Mark 2/15/2006

Approved By: 2/16/2006

NRC Acceptance (Date):

NRC Information Request Form

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AMR-238		1/25/2006	AMR Audit
Topic:		***Status:***	Closed
Mechanical Systems			

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

GM2 Based on review of the Table 2s for Sections 3.1 through 3.4, the following AMPs are credited to manage "loss of preload":
·□Bolting Integrity (B.1.12)
·□Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16)
·□ASME Section XI, Subsection IWE (B.1.27)

For each AMP, describe the inspections that will be conducted to detect loss of preload, and provide the technical basis for concluding that the methods employed are adequate.

Assigned To: Muggleston, Kevin

Response:

Bolting Integrity (B.1.12):

Pressure retaining bolting in ASME Class 1, 2 and 3 systems is periodically inspected for signs of leakage and degradation during ASME Section XI ISI system pressure tests. These inspections provide for early detection of leakage and material degradation in pressure retaining bolted joints that may be caused by loss of material, cracking or loss of preload of the bolting, prior to loss of system or component intended functions. The integrity of pressure retaining bolted joints in non-ASME Class 1, 2 and 3 systems and components are evaluated during normal plant operation and maintenance activities.

Oyster Creek ISI program plan tables provide the examination category and description as identified in ASME Section XI, Table IWB-2500-1 for Class 1 components, Table IWC-2500-1 for Class 2 components, and Table IWD-2500-1 for Class 3 components.

Examinations at Oyster Creek are currently performed in accordance with the 1995 Edition of the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," through 1996 addenda, per the Oyster Creek ISI program plans. Examinations for the period of

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extended operation will be in accordance with the appropriate code edition and addenda for the OC ISI Program Plan. The extent and schedule of the inspections is in accordance with IWB-2500-1, IWC-2500-1 and IWD-2500-1 and assures that detection of leakage or fastener degradation will occur prior to loss of system or component intended functions.

Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16):

The program activities verify structural integrity of crane and hoist elements required to maintain their intended function and comply with ASME/ANSI and OSHA requirements. The inspection activities credited to manage Loss of Preload consist of visual inspections for conditions such as missing, corroded or loose bolts. The program also relies on procurement controls and installation practices, defined in plant procedures, to ensure that only approved lubricants and proper torque are applied consistent with the NUREG-1801 bolting integrity program. These practices will preclude significant loss of preload of the bolted connections.

ASME Section XI, Subsection IWE (B.1.27):

The Oyster Creek ASME Section XI, Subsection IWE aging management examination methods used at Oyster Creek are visual examination (general visual, VT-3, VT-1) and limited volumetric examination (ultrasonic thickness measurement) when augmented examinations are required. In the Oyster Creek ASME Section XI, Subsection IWE aging management program, bolt preload is not checked by either a torque or tension test, rather acceptance is based on Appendix J testing of associated bolted components and a general visual examination, as authorized in accordance with 10 CFR 50.55a (a)(3)(i).

Containment leak rate tests are conducted in accordance with10 CFR Part 50, Appendix J. The tests are credited for primary containment pressure boundary components to assure that leakage through the primary containment does not exceed leakage limits specified in the Technical Specifications. The tests are described in the Oyster Creek 10 CFR Part 50, Appendix J aging management program.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/14/2006

Reviewed By: Ouaou, Ahmed 2/14/2006

Approved By: 2/16/2006

NRC Acceptance (Date):

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Topic:
Mechanical Systems

Status: Closed

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

GM3 Based on review of the Table 2s for Sections 3.1 through 3.4, there are many combinations of materials and environments for which "NONE/NONE" is indicated for Aging Effect /Aging Program. These are generally consistent with the January draft update to GALL, the "EPRI Mechanical Tools" guidance, and established past precedence from prior LRA reviews. However, there is no discussion in the LRA of OCGS plant-specific operating experience, related to these material/environment combinations.
For each material/environment combination for which NONE/NONE is indicated for Aging Effect/Aging Program, discuss the plant-specific operating experience that supports this AMR determination. If plant-specific operating experience indicates occurrence(s) of degradation for a particular material/environment combination, describe the OCGS plant-specific AMR in detail and identify the aging management activities that will be credited for the extended period of operation.

Assigned To: Muggleston, Kevin

Response:

This information is included in the system specific Aging Management Review technical basis documents that will be available for review during the AMR audit.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/ 8/2006

Reviewed By: Micklo, Charles 2/14/2006

Approved By: Warfel, Don

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Topic:
Mechanical Systems

Status: Closed

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

GM4 Based on review of the Table 2s for Sections 3.1 through 3.4, the one-time inspection program is credited for managing crack initiation and growth in Class 1 small bore piping and valves, less than 4" NPS. Please clarify the following, related to the scope and inspection methods used:
1.□The GALL AMP specifies that small bore piping includes 4" NPS and under. The OCGS AMP specifies less than 4" NPS. Please clarify this apparent difference in scope.
2.□In the range of pipe sizes 4" NPS and under, the method of joining spool pieces typically includes both butt welding and socket welding. Socket welded construction is typically used for the smaller diameter pipes. Please describe the scope of piping included in the one-time inspection program, including (1) the approximate percent of each pipe size from 4" NPS to < 1" NPS; (2) the type of welded construction for each pipe size; (3) the plant-specific operating experience related to aging degradation and corrective actions for each pipe size; and (4) the inspection sample size for each pipe size.
3.□For small-bore piping that is socket welded, please describe the specific type of examination to be performed as part of the one-time inspection, to manage crack initiation and growth, and provide the technical basis for concluding that the methods employed are adequate.
4.□For small bore piping that is butt welded, please describe the specific type of volumetric inspection to be performed as part of the one-time inspection, to manage crack initiation and growth.

Assigned To: Miller, Mark

Response:

Since this question is similar to AMP-264, this question will be closed. AMP-264 will remain open until the socket weld issue is resolved.

1.The One-Time Inspection program will be used to 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. There is conflicting direction in the September 2005 GALL regarding this requirement. GALL program XI.M1 for ASME Section XI IWB, IWC, and IWD for Examination category B-J states that volumetric examination of the ID and surface examination of the OD for circumferential and longitudinal welds in each pipe or

branch run NPS 4 in. or larger is required. It further states that surface examination is to be conducted for circumferential and longitudinal welds in each pipe or branch run less than NPS 4 in. and for all socket welds. These requirements are similar to those in the 95 Edition, 96 Addenda of the code which is the current requirement for the 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. Accordingly, One-Time inspection is not required for 4 in. NPS since volumetric examination is already required by Examination Category B-J. However, both GALL programs XI.M32 for One-Time Inspection and XI.M35 for One Time Inspection of ASME Code Class 1 Small Bore Piping indentify 4 in. NPS as requiring one-time inspection. It is noted that Program Basis Document PBD-AMP-B.1.24 currently references both Class 1 piping "less than or equal to NPS 4" and "less than four inch NPS." This will be revised to address Class 1 piping less than 4 inch NPS.

2.The one-time inspection for Class 1 piping, piping components, and piping elements for cracking initiation and growth due to thermal and mechanical loading, stress corrosion cracking, and intergranular stress corrosion cracking includes a representative sample of the susceptible items, and, where practical, focuses on the bounding or lead items most susceptible to cracking due to time in service, severity of operating conditions, or lowest design margin.

Applying ASME Code Case N-578-1, "Risk Informed Requirements for Class 1, 2, or 3 Piping, Method B Section XI, Division 1" is one method other applicants have used for determining sample size for one-time inspections. With this method, butt welds are evaluated based on risk and "binned" into high, medium, and low risk categories. The selected sample for one-time inspection volumetric examination then included 10 % of the high and medium risk butt welds. Oyster Creek however has not employed risk informed ISI and does not currently have a risk based evaluation that categorizes the Class 1 butt welds into risk categories. This evaluation is extensive and to perform this evaluation at this time is not practical so ASME Code Case N-578-1 will not be utilized. Instead, the one-time inspection sample size will include 10% of the total butt welds in Class 1 piping less than 4" NPS. The actual inspection locations will be based on physical accessibility, exposure levels, NDE techniques, etc. and will be determined with site involvement.

Oyster Creek piping is based upon the ANSI B31.1 (1963) Power Piping specification. The Class 1 piping classification is based upon ASME Section XI. The Oyster Creek line specifications, Piping and Instrument drawings, Isometric Configuration drawings and input from the Oyster Creek ISI coordinator were used to determine the location and population of butt welds less than four inches. Although planning has not yet been finalized, the following information can be provided: The population includes welds on the Reactor Recirculation System, the CRD return line, the reactor vessel bottom head drain line, the reactor head vent line (Main Steam system), and the Reactor Water Cleanup System. The butt welds less than 4" NPS in these systems are two and three inch in size (there is no 2 ½ inch Class 1 piping; nor are there any butt welds on the 1 inch Class 1 piping). The proposed sample includes a representative sample of welds from these systems and includes both two and three inch NPS pipe.

Based on a review of the Oyster Creek CAP System (Corrective Action Program) from 1998 through present, cracking due to SCC, IGSCC, or thermal and mechanical loading has not been found on class 1 piping less than 4" NPS. An evaluation of Oyster Creek OE was performed in 2000 in

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response to industry concerns related to vibration related and thermal fatigue failures of small bore piping. That review identified one (1) event in which a safety related small bore socket welded connection failed. This failure was attributed to a weld defect rather than vibration related or thermal fatigue.

3.The one time inspection program sample does not include socket welded connections. Based on a review of the Oyster Creek CAP System (Corrective Action Program) from 1998 through present, cracking due to SCC, IGSCC, or thermal and mechanical loading has not been found on class 1 piping less than 4" NPS. Socket weld cracking generally occurs due to weld defect propagation by vibrational fatigue. Stress corrosion cracking and thermal fatigue rarely cause socket weld failures. Vibration induced socket weld failures is a design issue that has been observed in the nuclear industry and can result in crack initiation and growth. Vibration induced fatigue is fast acting and is typically detected early in a component's life. An evaluation of Oyster Creek OE was performed in 2000 in response to industry concerns related to vibration related and thermal fatigue failures of small bore piping. That review identified one (1) event in which a safety related small bore welded connection failed. This failure was attributed to a weld defect rather than vibration related or thermal fatigue. Based upon this rationale and plant specific operating experience, cracking due to vibration-induced fatigue is not considered an aging effect for the period of extended operation. The One-Time Inspection program sample will select full penetration butt welds where ultrasonic testing can be performed. The butt welds are more susceptible to stress corrosion cracking and thermal fatigue, which are the primary crack initiation and growth aging mechanisms. This position is supported by recent past precedence at Point Beach and Browns Ferry.

4.UT techniques consistent with the ASME Code and 10 CFR Part 50, Appendix B will be used for the inspection of butt welds.

LRCR #: 260 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 2/15/2006

Reviewed By: Muggleston, Kevin 2/16/2006

Approved By: Warfel, Don 2/16/2006

NRC Acceptance (Date): 2/16/2006

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Topic:
Mechanical Systems

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

gm5 Based on review of the Table 2s for Sections 3.1 through 3.4, the Buried Piping Inspection program (AMP B.1.26) is credited to manage "loss of material" for piping and fittings exposed to soil. Please confirm that at least one inspection has been, or will be performed during the 10-year period immediately prior to entering the license renewal period for each of the systems for which this AMP is credited. Also, please provide the results of any inspections that have already been completed.

Assigned To: Rafferty-Czincila, Shannon

Response:

NUREG-1801 States:
"It is anticipated that one or more opportunistic inspections may occur within a ten-year period. Prior to entering the period of extended operation, the applicant is to verify that there is at least one opportunistic or focused inspection is performed within the past ten years." It does not require inspection of each of the systems for which the AMP is credited. NUREG 1801 further states: "Any credited inspection should be performed in areas with the highest likelihood of corrosion problems, and in areas with a history of corrosion problems." Based on Oyster Creek operating experience, there has been only one underground leak that developed as a result of failure of the external coating of carbon steel pipe. In 1992 the Service Water system developed a leak that resulted from failure of the external coating. The root cause evaluation determined that failure was due to improper original coating application. Additionally, in 1980, 1992 & 1996 leaks developed in buried aluminum Condensate Transfer pipe. As a result 90% of the AL piping was replaced and relocated aboveground. Subsequently, Oyster Creek initiated the Oyster Creek Underground Piping Program in which the inspection and modifications of the remaining 25 feet of buried AL Condensate Transfer system pipe are tracked. To date, there have been no other buried pipe leaks due to external degradation. (Reference: AMP-PBD-B.1.26, Section 2.1.f) Therefore the aluminum piping is considered the to have the highest likelihood of corrosion problems. AR A2116126 is scheduled to inspect the coatings on two underground aluminum condensate transfer lines in 2006. Additionally, ECR 05-00344 is scheduled to replace underground carbon steel Service Water (SW) piping in 1R21 (2006). During this replacement the SW piping will be excavated and inspections of the external coating of the SW piping will be conducted in accordance with SA-AA-117.

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LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 2/ 8/2006

Reviewed By: Getz, Stu 2/ 8/2006

Approved By: Warfel, Don 2/ 8/2006

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Topic:
Reactor Vessel Internals & Reactor Coolant System

Status: Closed

Document References:
B.3.1

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

3.1-1 Section 3.1.2.2.11 of the OCGS LRA provides the further evaluation to address cracking due to flow-induced vibration for the stainless steel steam dryers. The LRA states that the Reactor Internals Program, (AMP B.1.9) will be implemented to manage cracking in the steam dryer. The guidelines of BWRVIP-139 will also be implemented when this document is issued. Please discuss the aging management guidelines from BWRVIP-139 that will be implemented to manage steam dryer cracking, and indicate when BWRVIP-139 will be issued. Also, please provide a copy of the draft BWRVIP-139 for review during the audit.

Assigned To: May, Mike

Response:

AMR-242 Steam Dryer

1.History - Oyster Creek has been inspecting the steam dryer every refueling outage for many years. In 1984 (10R) a cracked brace weld was found in bank 4-5, which was underwater weld repaired in the equipment storage pool. In 1986 a cracked brace weld was found in bank 5-6, which was underwater weld repaired in the equipment storage pool. No indications of cracking were found in the 1989 and 1991 refueling outages. In 1992 the previously repaired brace weld (bank 5-6) was found cracked and a second weld repair was implemented by underwater welding in the equipment storage pool. Stiffeners were added to the vertical plates where cracked. In 1994 the same bank 5-6 brace weld was found cracked. A different repair method, "stop drilling", was implemented to eliminate cracking propagation.

2. Effectiveness - Visual inspections of the Steam Dryer performed in 1996, 1998, 2000, 2002, and 2004 found no signs of cracking, which indicates the stop drilling repair has been effective.

3. Current Program - Currently the steam dryer is inspected in accordance with the recommendation of SIL 644, Revision 1. Inspections in 2006 with continue to follow the inspections of SIL 644. The Oyster Creek inspection is not impacted by the comments on SIL 644 provided the NRC staff to the BWR Owners Group in Jan 2005. The NRC comments primarily address concerns associated with

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extended power uprate (EPU). Oyster Creek has not implemented EPU, nor is such an uprate planned. In 2008 Oyster Creek will implement the inspection requirements of BWRVIP-139.

4. Period of Extended Operation - The BWRVIP-139 dryer inspections performed are meant to establish a baseline. The results of these inspections will be evaluated to establish future scope and schedule for steam dryer inspections. Oyster Creek will comply with the recommendations of the BWRVIP regarding steam dryer inspections. Any flaws found during inspections will be evaluated and reinspection performed if required. Performing the inspections in accordance with BWRVIP-139 provides reasonable assurance that the steam dryer will perform its intended function during the period of extended operation.

A copy of the draft BWRVIP-139 was provided to the NRC for review during the audit.

Note: The LRA erroneously refers to BWRVIP-135 instead of BWRVIP-139 in several places. These errors will be corrected and revised pages sent to the NRC.

LRCR #: 275 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: May, Mike 2/16/2006

Reviewed By: Getz, Stu 2/16/2006

Approved By: Warfel, Don

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Topic:
Reactor Coolant Pressure Boundary

Document References:
B.3.1

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

3.1-2 Section 3.1.2.2.12 of the OCGS LRA provides the further evaluation to address cracking due to thermal and mechanical loading in Class 1 small-bore steel, steel with stainless steel cladding, and stainless steel reactor coolant system and connected system piping less than NPS 4.
Section 3.1.2.2.12 of the OCGS LRA states that Oyster Creek will use the ASME Section XI, Inservice Inspection, Subsections IWB, IWC, and IWD program (AMP B.1.1) to mitigate cracking due to thermal and mechanical loading of steel and stainless steel piping, piping components, fittings and branch connections exposed to reactor coolant within the RCPB. Oyster Creek will also use the One-Time Inspection program (AMP B.1.24) to verify that service-induced weld cracking is not occurring in the small-bore piping less than NPS 4, including pipe, fittings, and branch connections.
Section 3.1.2.2.12 of the OCGS LRA also states that the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD program will be used for Class 1 steel pipe, fittings, and branch connections that are greater than or equal to NPS 4 to verify stress corrosion cracking is not occurring and to ensure the component intended function will be maintained during the extended period of operation. With regard to this further evaluation, please provide the following information:
1.□Please describe what type of destructive or non-destructive volumetric examination will be performed as part of the one-time inspection program (AMP B.1.24) to permit inspection of the inside surfaces of the small-bore piping.
2.□With regard to the last portion of the evaluation related to pipe, fittings, and branch connections greater that NPS 4, please clarify the intent of including large bore piping and components in this further evaluation.

Assigned To: Getz, Stu

Response:

1. Please refer to the response to AMR-240 which describes the type of volumetric examinations to be performed as part of the One-Time Inspection program for inspection of Class 1 small-bore piping for cracking.

2. Large-bore (greater than or equal to NPS 4) Class 1 steel piping was included in applications of R-55 with a generic note indicating that the component is different (greater than or equal to 4 NPS vs.

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less than 4 NPS) to credit the application of the ASME Section XI ISI program with inspection of piping and components for cracking, as applicable. No other GALL line items were found to address Section XI ISI inspection for cracking of large-bore piping and components.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Getz, Stu 2/ 8/2006

Reviewed By: Miller, Mark 2/ 9/2006

Approved By: Warfel, Don 2/ 9/2006

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Topic:
Reactor Vessel Internals & Reactor Coolant System

Document References:
B.3.1

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

3.1-3 Table 1, item 3.1.1-31 of the OCGS LRA addresses stainless steel and nickel alloy reactor vessel penetrations. The vessel drain line has a penetration exposed to reactor water; however, the discussion column does not include this penetration. Please confirm that the reactor vessel drain line penetration is included in this line item.

Assigned To: May, Mike

Response:

The bottom head nozzle is a two-inch partial weld penetration that is made of carbon steel and is not included with the stainless and nickel alloy penetrations discussed in item 3.1.1-31. The aging management of the bottom head drain nozzle is described in page 1 of Table 3.1.2.1.5 (LRA page 3.1-77)

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By:	May, Mike	2/ 7/2006
Reviewed By:	Getz, Stu	2/ 7/2006
Approved By:	Warfel, Don	2/ 7/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-245

Date Received: 1/25/2006

Source AMR Audit

Topic:
Reactor Coolant Pressure Boundary

Status: Closed

Document References:
B.3.1

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

3.1-4 Table 3.1.2.1.3 in the OCGS LRA includes line items for restricting orifice, and valve bodies, and cracking is managed by the water chemistry and one-time inspection AMPs. Plant specific note 5 to this table states that ASME Section XI ISI, Subsections IWB, IWC, and IWD, does not apply to these components. Similar AMR line items and plant specific notes are included for valves in Tables 3.3.2.1.9 and 3.3.2.1.25.

Please clarify why ASME Section XI ISI, Subsections IWB, IWC, and IWD, does not apply to valves. Also, please provide the technical basis for concluding that the water chemistry and one-time inspection programs alone, without periodic inspections, will adequately manage cracking of these components during the period of extended operation.

Assigned To: Getz, Stu

Response:

ASME Section XI ISI, Subsections IWB, IWC, and IWD does apply to valves, but not for mitigation of cracking, except for the Electromatic Relief Valves (EMRVs) in the Main Steam system, see below.

In line items R-03 and R-55 (subsequently deleted from the September 2005 Revision 1 to GALL) which address cracking in piping, GALL does not credit ASME Section XI ISI, Subsections IWB, IWC, and IWD for managing cracking in valves. (The component grouping is "Class 1 piping, fittings, and branch connections < NPS 4", not "piping, piping components, and piping elements" which is defined to include valves.) In the ISI program, only Category B-M-1, which UT tests welds in valve bodies, could detect cracks in valve bodies. At Oyster Creek, this is applied only to the EMRVs in the Main Steam system. ISI inspection of valves per B-M-2 is by VT-3 which visually inspects for corrosion, wear, or erosion, but is not credited for crack detection.

ISI addresses the welds (including the weld between between pipe and valve body) and BWRSCC addresses cracking in the heat affected zone. The ISI program is not credited for crack mitigation in valves (except for the EMRVs in Main Steam as discussed above, which is specifically addressed in the OC ISI program plan).

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January 2005 draft GALL line item R-55 states that AMPs for managing cracking are to be augmented by verification that cracking is not occurring, and states that One-Time inspection is an acceptable verification method. The One-Time Inspection aging management program is used to verify the system-wide effectiveness of aging management programs such as water chemistry that are designed to prevent or minimize aging to the extent that it will not cause a loss of intended function during the period of extended operation. The program provides inspections that either verify that unacceptable degradation is not occurring or that trigger additional actions that will assure the intended function of affected components will be maintained during the period of extended operation. The One-Time Inspection aging management program is used to confirm the effectiveness of the Water Chemistry program to manage crack initiation and growth aging effects during the period of extended operation.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: Getz, Stu 2/ 7/2006

Reviewed By: Miller, Mark 2/ 9/2006

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date): 2/15/2006

NRC Information Request Form

Item No	*Date Received:*	*Source*
AMR-246	1/25/2006	AMR Audit
	Status:	Closed

Topic:
Engineered Safety Fetures

Document References:
B.3.2

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

3.2-1 Section 3.2.2.2.4 of the OCGS LRA provides the further evaluation to address loss of material due to general, pitting, crevice, and microbiologically influenced corrosion (MIC) for carbon steel portions (Table 3.2-1, item 5) of BWR containment isolation piping, piping components, and piping elements exposed internally to untreated water. Please provide the following information with regard to this evaluation:
1.□Section 3.2.2.2.4 states that Oyster Creek will use the One-Time Inspection program (AMP B.1.24) to manage loss of material for steel piping in the Drywell Floor and Equipment Drains System that provides a containment isolation barrier. Please discuss the technical basis for concluding that one-time inspection alone is adequate to ensure that the drywell floor and equipment drains piping that provides a containment isolation barrier will perform its intended functions during the period of extended operation.
2.□Section 3.2.2.2.7.2 of the LRA addresses loss of material for carbon steel components in a "raw water" environment, and reference is made to Section 3.2.2.2.4. However, the environment addressed in Section 3.2.2.2.4 is "untreated water." Please clarify this apparent discrepancy.
3.□Please discuss how other components that perform a containment isolation function (i.e., piping, pipe fittings, valves etc. in the cooling water systems of the MS, FW, RHR process piping containment penetrations) exposed to raw or untreated water will be managed for this aging effect.

Assigned To: Getz, Stu

Response:

1. Aging effects of the Drywell Floor and Equipment Drains System piping providing a containment isolation function are managed with the Structures Monitoring Program for external surfaces, and the One-Time Inspection program for internal surfaces. The One-Time Inspection program confirms the absence of aging effects in pooled or potentially stagnant flow areas of drain piping and piping elements. The water in reactor building floor drain sump consists primarily of formerly treated water sourced from containment systems. This relatively high quality water, along with a lack of operating experience citing age-related issues with this piping indicated that a one-time inspection program was appropriate for ensuring the piping and components will perform their intended function during the

period of extended operation. Any observed conditions that have the potential for impacting the intended function are evaluated or corrected in accordance with the corrective action process.

2. In accordance with the definitions in the January 2005 draft GALL, there is no discrepancy. The water in reactor building floor drain sump consists primarily of formerly treated water sourced from containment systems. While this water is relatively high quality, it cannot continue to be considered treated water. The January 2005 draft GALL, Section IX.D, defined an environment of "untreated water or raw water". In this definition, untreated was stated to be a broad term that overlaps with raw water. In the Oyster Creek LRA, the GALL line item for untreated water was used to address the raw water-fresh water environment in this system.

3. The Drywell Floor and Equipment Drains System is the only system with a raw or untreated water environment that also provides a containment isolation function. As discussed above, aging effects in this system for piping providing a containment isolation function are managed with the Structures Monitoring Program for external surfaces, and the One-Time Inspection program for internal surfaces.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Getz, Stu 2/ 7/2006

Reviewed By: Corsi, Lou 2/ 9/2006

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date): 2/15/2006

NRC Information Request Form

Item No
AMR-247

Date Received: 1/25/2006

Source AMR Audit

Status: Closed

Topic:
Engineered Safety Features

Document References:
B.3.2

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

3.3-2 Section 3.2.2.2.5 of the OCGS LRA addresses the further evaluation for hardening and loss of strength due to elastomer degradation in seals associated with BWR standby gas treatment systems. The LRA states that Oyster Creek will use the Periodic Inspection of Ventilation Systems program (AMP B.2.4) to evaluate elastomer door seals and flexible connections in the Standby Gas Treatment System. Please confirm that door seals and flexible connections are the only components in this system with elastomer seals.

Assigned To: Micklo, Charles

Response:

Regularly opened door seals and flexible connections at the fans are the only elastomers requiring aging management in the Standby Gas Treatment System. Installed gaskets, component seals and o-rings are considered consumables not subject to an AMR, see LRA Section 2.1.6.4. The bi-weekly SGTS surveillance test, see PBD-AMP-B.2.04, Table 5.1, confirms proper function of each SGTS train with acceptance criteria for flow rate and reactor building differential pressure.

LRA Section 2.1.6.4 states "The evaluation process for consumables is consistent with the guidance provided in NUREG-1800 Table 2.1-3. Consumables have been divided into the following four categories for the purpose of license renewal: (a) packing, gaskets, component seals, and O-rings; (b) structural sealants; (c) oil, grease, and component filters; and (d) system filters, fire extinguishers, fire hoses, and air packs. Group (a) subcomponents (packing, gaskets, seals, and O-rings): Based on ANSI B31.1 and the ASME B&PV Code Section III, the subcomponents of pressure retaining components as shown above are not pressure-retaining parts. Therefore, these subcomponents are not relied on to form a pressure-retaining function and are not subject to an AMR."

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Micklo, Charles	2/ 2/2006
Reviewed By:	Muggleston, Kevin	2/ 7/2006
Approved By:	Warfel, Don	2/ 7/2006
NRC Acceptance (Date):		

NRC Information Request Form

Item No
AMR-248

Date Received: 1/25/2006

Source AMR Audit

Status: Accepted by NRC

Topic:
Engineered Safety Features

Document References:
B.3.2

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

3.3-3 Section 3.2.2.2.8.2 of the OCGS LRA, which addresses loss of material due to general, pitting and crevice corrosion in steel ducting closure bolting and piping in contact with treated water, states that the Oyster Creek Engineered Safety Features Systems have no carbon steel piping, piping components, or piping elements (internal surfaces) exposed to condensation, treated water, or air-indoor uncontrolled environments within the scope of license renewal. However, LRA section 3.2.2.2.8.1, which addresses loss of material due to general, pitting and crevice corrosion in aluminum and steel piping in contact with treated water, states that the Water Chemistry and the One-Time Inspection AMPs will be used to manage aging of carbon steel piping exposed to treated water. Please clarify this discrepancy.

Assigned To: Getz, Stu

Response:

The Oyster Creek LRA used line item 3.2.1-10 (E-08) and associated further evaluation section 3.2.2.2.8.1 for steel piping in contact with treated water in the Engineered Safety Features (ESF) Systems. In the GALL, this line item invokes the Water Chemistry and a One-Time Inspection programs with further evaluation recommended and was the clearly applicable choice for managing aging effects in water-carrying process piping for the ESF systems. Line item 3.2.1-10 was only used for Oyster Creek as related item E-40 for steel closure bolting in the Standby Gas Treatment System. In the January 2005 draft GALL, this line item specifies a plant specific program for aging management. The statement in the associated further evaluation section 3.2.2.2.8.2 for item 3.2.1-10 (that the ESF systems have no carbon steel piping, piping components, or piping elements (internal surfaces) exposed to condensation, treated water, or air-indoor uncontrolled environments) was made within the context of this line item's application to a wetted-air internal environment, and was not used for the steel piping lines of the ESF systems. "Treated Water" was included to match the SRP wording in section 3.2.2.2.8.2. To correct this discrepancy, this statement will be revised in a supplement document to read as follows:

The Oyster Creek Engineered Safety Features Systems have no steel piping, piping components, or piping elements (internal surfaces) exposed to condensation, treated water (in the form of

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condensation wetting the internal surface), or air-indoor uncontrolled environments.

LRCR #: 272 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Getz, Stu 2/15/2006

Reviewed By: Corsi, Lou 2/15/2006

Approved By: Warfel, Don 2/15/2006

NRC Acceptance (Date): 2/15/2006

NRC Information Request Form

Item No
AMR-249

Date Received: 1/25/2006

Source AMR Audit

Topic:
Engineered Safety Features

Status: Closed

Document References:
B.3.2

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

3.2-4 Section 3.2.2.2.2 of the OCGS LRA provides the further evaluation for loss of material due to general corrosion for carbon steel components exposed to air and moisture. The LRA states that the one-time inspection program (AMP B.1.24) will be used to manage loss of material in the isolation condenser shell and shell side components; and the internal surfaces of vent piping exposed to indoor air. Please discuss the technical basis for concluding that one-time inspection alone is adequate to manage aging during the period of extended operation.

Assigned To: Getz, Stu

Response:

The Oyster Creek One-Time Inspection aging management program is 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 managing program is not warranted. The program is used to confirm that the loss of material in steel piping, piping components, and piping elements is insignificant in an indoor air (internal) environment. The portion of the isolation condenser shell and internal surfaces of vent piping exposed to internal air are not routinely wetted, and it is expected that these surfaces will not exhibit significant corrosion. Operating Experience has shown that neither of the isolation condenser shells has exhibited pitting due to corrosion to any appreciable degree. However, any observed conditions that have the potential for impacting the system's ability to perform its intended function are evaluated and corrected in accordance with the corrective action process.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Getz, Stu 2/ 7/2006

Reviewed By: Corsi, Lou 2/ 9/2006

NRC Information Request Form

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date): 2/15/2006

NRC Information Request Form

Item No
AMR-250

Date Received: 1/25/2006

Source AMR Audit

Status: Closed

Topic:
Auxiliary Systems

Document References:
B.3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

3.3-1 A number of the AMRs in the OCGS LRA refer to the internal environments "raw water" and "untreated water" (e.g., Table 3.3.1-51 and 3.3.1-66); however, neither environment is defined in Table 3.0.1 of the OCGS LRA. Please define these environments

Assigned To: Miller, Mark

Response:

The Oyster Creek LRA Table 2 AMR's do not refer to "raw water" or to "untreated water" environments. The LRA Table 2 AMR's refer to environments of "Raw Water - Fresh Water" and "Raw Water - Salt Water". These environments are defined in LRA Tables 3.0-1 and 3.0-2 for internal and external service, respectively.

The term "untreated water" was used in LRA Table 1 rollup items 3.3.1-23, 3.3.1-66 and 3.3.1-67 in the quoted GALL "Component" column. The term "untreated water" was not used in LRA Section 3 Table 1 "Discussion" column for Oyster Creek.

The term "raw water" was used in both the LRA Section 3 Table 1 quoted GALL "Component" column and in the "Discussion" column for Oyster Creek. The majority of the Section 3 Table 1 references to raw water in the "Discussion" column for Oyster Creek include the clarifiers of fresh water or salt water. However, line items 3.3.1-51, 3.3.1-52, 3.3.1-53, and 3.3.1-59 referred only to "raw water" in the "Discussion" column for Oyster Creek. The determination of "fresh water" versus "salt water" can be made by connection with the identified aging management program (i.e., raw water associated with Fire Water System AMP is fresh water; raw water associated with Open-Cycle Cooling Water System AMP is salt water).

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Miller, Mark	2/ 3/2006
Reviewed By:	Getz, Stu	2/ 7/2006
Approved By:	Warfel, Don	2/ 7/2006
NRC Acceptance (Date):		

NRC Information Request Form

Item No
AMR-251

Date Received: 1/25/2006

Source AMR Audit

Status: Closed

Topic:
Auxiliary Systems

Document References:
B.3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

3.3-2 Section 3.3.2.2.5.1 of the OCGS LRA contains the further evaluation for hardening and loss of strength of elastomer seals and components in heating and ventilation systems. The OCGS LRA states that the Periodic Inspection of Ventilation Systems program, AMP B.2.4, will be implemented to perform internal and external inspections of elastomer components in a number of heating and ventilation systems. With regard to this aging management program, a) please clarify whether AMP B.2.4 will be a sampling program, or if all elastomer components will be inspected, and b) please explain how elastomer components in inaccessible areas of the various heating and ventilation systems will be addressed.

Assigned To: Micklo, Charles

Response:

a) The Periodic Inspection of Ventilation Systems program, AMP B.2.4 is a comprehensive inspection program performed during routine component maintenance. All elastomers subject to aging management are inspected.
b) Door seals on doors that are periodically opened and therefore subject to wear, and flexible connections are the only elastomers requiring aging management in the ventilation systems managed by Periodic Inspection of Ventilation Systems program. All of these components are accessible. Installed gaskets, component seals and o-rings are considered consumables not subject to an AMR.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Micklo, Charles 2/ 7/2006

Reviewed By: Muggleston, Kevin 2/ 7/2006

Approved By: Warfel, Don 2/ 8/2006

NRC Information Request Form

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-252

Date Received: 1/25/2006

Source AMR Audit

Status: Closed

Topic:
Auxiliary Systems

Document References:
B.3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

3.3-3 Section 3.3.2.2.6.1 of the OCGS LRA contains the further evaluation for loss of material due to general corrosion for steel piping, bolting, and component external surfaces exposed to air or condensation on their external surface. The OCGS LRA states that inspections will be performed on the affected components using the following aging management programs:
·□Fire Protection Program, AMP B.1.19
·□Fire Water System Program, AMP B.1.20
·□Periodic Inspection of Ventilation System Program, AMP B.2.4
·□Structures Monitoring Program, AMP B.1.31
For each of the aging management programs credited please provide the following: a) the frequency for the external surface inspections (except for AMP B.1.31 which states a 4 year frequency in the LRA); b) when the inspections will be initiated; c) clarification on how inspections of components that are insulated will be addressed (except for AMP B.1.31 which is addressed in the LRA), and d) clarification on how inspections of components in inaccessible areas of the systems will be addressed.

Assigned To: Muggleston, Kevin

Response:

Fire Protection Program, AMP B.1.19

a) 18 months

b) Some inspections are ongoing, but the enhanced inspections for license renewal will be initiated prior to entering the period of extended operation.

c) None of the components included in the scope of these inspections are insulated.

d) NFPA 25 allows an exception from inspection for pipe in concealed spaces or other inaccessible areas. Most of the components included in the scope of these inspections are accessible. There is sufficient accessible piping to provide a representative assessment of the degree of external surface

degradation.

Fire Water Program, AMP B.1.20

a) External surfaces of the spray and sprinkler systems in the scope of license renewal are visually inspected every 12 months. The condenser bay sprinkler system is located in a high radiation area and is inspected every 24 months. Fire hydrant external surfaces are visually inspected every 6 months.

b) Some inspections are ongoing, but the enhanced inspections for license renewal will be initiated prior to entering the period of extended operation.

c) None of the components included in the scope of these inspections are insulated.

d) NFPA 25 allows an exception from inspection for pipe in concealed spaces or other inaccessible areas. Most of the components included in the scope of these inspections are accessible. There is sufficient accessible piping to provide a representative assessment of the degree of external surface degradation.

Periodic Inspection of Ventilation Systems Program, AMP B.2.4

a) 5 years

b) Some inspections are ongoing, but the enhanced inspections for license renewal will be initiated prior to entering the period of extended operation.

c) None of the components included in the scope of these inspections are insulated.

d) All components included in the scope of these inspections are accessible.

Structures Monitoring Program, AMP B.1.31

b) Some inspections are ongoing, but the enhanced inspections for license renewal will be initiated prior to entering the period of extended operation.

d) Inaccessible components will not be routinely inspected. There are sufficient accessible components to provide a representative assessment of the degree of external surface degradation. Degraded conditions identified as a result of these inspections will be evaluated using the Oyster Creek corrective actions process, which will evaluate extent of condition including consideration of inaccessible locations.

LRCR #: *LRA A.5 Commitment #:*

IR#:

NRC Information Request Form

Approvals:

Prepared By:	Muggleston, Kevin	2/ 4/2006
Reviewed By:	Getz, Stu	2/ 7/2006
Approved By:	Warfel, Don	2/ 7/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-253

Date Received: 1/25/2006

Source AMR Audit

Status: Closed

Topic:
Auxiliary Systems

Document References:
B.3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

3.3-4 Section 3.3.2.2.13 of the OCGS LRA contains the further evaluation for loss of material due to wear for elastomer components in the ventilation systems. The evaluation states that the Periodic Inspection of Ventilation Systems program, AMP B.2.4, will be implemented to inspect elastomer door seals; however, no other elastomer components are mentioned. Please confirm that, aside from door seals, there are no other elastomer components in the ventilation systems for which loss of material due to wear has been identified as an aging effect that needs to be managed.

Assigned To: Miller, Mark

Response:

Aside from door seals, there are no other elastomer components in the ventilation systems for which loss of material due to wear has been identified as an aging effect that needs to be managed.

In paragraph 3.3.2.2.13, the GALL report recommends further evaluation to ensure that the loss of material due to wear in elastomer collars and seals of ventilation system ducts are adequately managed. This recommendation aligns with Auxiliary Systems aging management evaluation Table 1 Item Number 3.3.1-28. In the Oyster Creek LRA, Table 1 Item Number 3.3.1-28 has only been applied to the loss of material in elastomer door seals exposed to an indoor air environment in the 480V Switchgear Room Ventilation System, Battery and MG Set Room Ventilation System, C Battery Room Heating & Ventilation System, Control Room HVAC System, Radwaste Area Heating and Ventilation System, Reactor Building Ventilation System, and the Standby Gas Treatment System (SGTS). The Periodic Inspection of Ventilation Systems (B.2.4) aging management program will be implemented for the inspection of elastomer door seals exposed to an indoor air environment.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Miller, Mark 2/ 7/2006

NRC Information Request Form

Reviewed By: Micklo, Charles 2/ 7/2006

Approved By: Warfel, Don 2/ 7/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-254

Date Received: 1/25/2006

Source AMR Audit

Topic:
Auxiliary Systems

Status: Accepted by NRC

Document References:
B.3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

3.3-5 Section 3.3.2.2.14 of the OCGS LRA contains the further evaluation for reduction of neutron-absorbing capacity and loss of material due to general corrosion for the neutron-absorbing sheets of the spent fuel storage rack in the spent fuel storage. The LRA states that the aging effects of the Boral spent fuel storage racks are insignificant and require no aging management. Test results on Boral coupons placed in 2000 showed no age-related degradation when inspected in 2002 and 2004. Please make available at the audit the OCGS document that contains the Boral coupon test results

Assigned To: Ouaou, Ahmed

Response:

The following reports are availlable for Staff review:
1. Holtec Report No. HI-2043279, summary Report of the examination of Oyster Creek Nuclear station Boral Surveillance Coupon No. HO910070-2-6 (2004 coupon tests).
2. Holtec Report No. HI-2033000, Examination of Oyster Creek Nuclear Station Boral Surveillance Coupon No. HO920023-2-6 (2002 coupon tests).

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Ouaou, Ahmed 2/ 8/2006

Reviewed By: Getz, Stu 2/ 8/2006

Approved By: Warfel, Don 2/ 7/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No	***Date Received:***	***Source***
AMR-255	1/25/2006	AMR Audit
Topic:	***Status:***	Closed

Auxiliary Systems

Document References:

B.3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

3.3-6 Table 3.3.2.1.41 of the OCGS LRA includes line items for brass and bronze valve bodies in the water treatment and distribution system that are exposed to treated water on the internal surface. The Selective Leaching of Materials AMP (B.1.25) is credited to manage selective leaching; however, loss of material due to pitting and crevice corrosion is not addressed. Please clarify how loss of material due to pitting and crevice corrosion will be managed for these components.

Assigned To: Rafferty-Czincila, Shannon

Response:

As a result of assembling the AMR Technical Basis Documents, it was discovered that the following line items need to be added to Table 3.3.2.1.41 to address how loss of material due to pitting and crevice corrosion will be managed for these components:

Valve Body - Leakage Boundary - Brass - Treated Water (Internal) - Loss of Material - Water Chemistry (B.1.2) - VII.E4-8 (AP-64) 3.3.1-38

Valve Body - Leakage Boundary - Brass - Treated Water (Internal) - Loss of Material -One-Time Inspection (B.1.24) - VII.E4-8 (AP-64) 3.3.1-38

Valve Body - Leakage Boundary - Bronze - Treated Water (Internal) - Loss of Material - Water Chemistry (B.1.2) - VII.E4-8 (AP-64) 3.3.1-38

Valve Body - Leakage Boundary - Bronze - Treated Water (Internal) - Loss of Material -One-Time Inspection (B.1.24) - VII.E4-8 (AP-64) 3.3.1-38

The AMR Technical Basis Documents have been completed and will be given to the NRC auditors on-site on Monday, Feb 13 in both hard copy and electronic format. Reference OC-AMR-M-2.3.3.41, Water Treatment & Distribution System.
The above change is being tracked via LRCR #265 and will be submitted in a supplement to the LRA.

LRCR #: 265 ***LRA A.5 Commitment #:***

NRC Information Request Form

IR#:

Approvals:

Prepared By:	Rafferty-Czincila, Shannon	2/ 7/2006
Reviewed By:	Miller, Mark	2/ 7/2006
Approved By:	Warfel, Don	2/ 7/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-256

Date Received: 1/25/2006

Source AMR Audit

Status: Closed

Topic:
Auxiliary Systems

Document References:
B.3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

3.3-7 Table 3.3.2.1-20 of the OCGS LRA addresses AMRs for the instrument air system. A number of the AMRs in this table identify components in a dry gas environment with no aging effect identified (e.g., brass valve body; brass piping and fittings); however, the Compressed Air Monitoring program (AMP B.1.17) is credited. Plant specific note 1 explains that this AMP maintains the internal compressed air environment sufficiently dry so that aging effects are precluded. In Branch Technical Position RLSB-1 (see Appendix A of the SRP-LR, Section A.1.2.1.5), the staff noted that an aging effect should be identified as applicable for license renewal even if there is a prevention or mitigation program associated with that aging effect. Please explain why no aging effect was identified for these AMRs.

Assigned To: Micklo, Charles

Response:

The Compressed Air Monitirong program provides confirmation of the environment, and is not considered a prevention or mitigation program to an aging effect as defined in NUREG-1800, Rev 1 Appendix A.1.2.1.5. NUREG-1801, Rev 1 Chapter IX Section D, Environments, defines the environment of dry air as "Air that has been treated to reduce the dew point well below the system operating temperature." Line items containing the material environment combinations utilized for the Instrument Air system are included in NUREG-1801 Draft Rev1 in line items VII.J-4, 20 & 25. They list an environment of dried air with no aging effect. Since the Aging Management Program required is listed as "None" the following plant specific note was included. "The environment of dried gas was used for the Instrument Air system. The Compressed Air Monitoring program is applied to the Instrument Air system components to confirm the internal environment remains sufficiently dry to preclude aging effects."

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Micklo, Charles	2/ 7/2006
Reviewed By:	Muggleston, Kevin	2/ 7/2006
Approved By:	Warfel, Don	2/ 7/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMR-257		1/25/2006	AMR Audit
Topic:		***Status:***	Closed
Auxiliary Systems			

Document References:
B.3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

3.3-8 In Table 3.3.1 of the OCGS LRA, line items 3.3.1-25 and 3.3.1-26 appear to be identical. Please clarify what the difference is between these line items, or why two identical line items were included in this table.

Assigned To: Miller, Mark

Response:

In accordance with the Draft January version of NUREG-1800/1801, Item Numbers 3.3.1-25 and 3.3.1-26 are identical in component type, aging effect/mechanism, and aging management program requirements. The difference in Item Numbers 3.3.1-25 and 3.3.1-26 is in the referenced Related Item. Item Number 3.3.1-25 identifies Related Item AP-35 which is for aluminum material. Item Number 3.3.1-26 identifies Related Item AP-44 which is for copper alloy material.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Miller, Mark	2/ 7/2006
Reviewed By:	Rafferty-Czincila, Shannon	2/ 7/2006
Approved By:	Warfel, Don	2/ 7/2006

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AMR-258

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Source AMR Audit

Status: Closed

Topic:
Auxiliary Systems

Document References:
B.3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

3.3-9 In Table 3.3.1 of the OCGS LRA, line item 3.3.1-31 addresses loss of material due to pitting and crevice corrosion for copper alloy components exposed to treated water and closed cycle cooling water. The LRA states that the closed-cycle cooling water program (AMP B.1.14) alone will be used to manage this aging effect for components in the closed cycle cooling water environment. Line items 3.3.1-39 and 3.3.1-42 address the same environment and aging effects for stainless steel; however, in these cases both the closed-cycle cooling water program and one-time inspection program are credited. GALL recommends the closed-cycle cooling water program alone for all of the aforementioned cases. With regard to these AMRs, a) please explain the rational for concluding that a one-time inspection is needed to verify the effectiveness of the closed-cycle cooling water program for stainless steel components, but not for copper alloy components; and b) please clarify whether the OCGS closed-cycle cooling water program (AMP B.1.14) includes an inspection of stagnant flow areas and crevices, as recommended in GALL AMP XI.M21.

Assigned To: Miller, Mark

Response:

The question refers to line item 3.3.1-31. This item should read 3.3.1-38.

As stated in the draft January version of XI.M21, Closed Cycle Cooling Water System, the control of water chemistry does not preclude corrosion at locations of stagnant flow conditions. For Oyster Creek, the One-Time Inspection program will be used to confirm the absence of aging effects in low flow or stagnant flow areas in closed cooling water systems (reference: PBD-AMP-B.1.24 for One-Time Inspection and PBD-AMP-B.1.14 for Closed Cycle Cooling Water Systems). The One-Time Inspection in low or stagnant flow areas has been applied to the component type of piping only.
a) LRA Line Item 3.3.1-38 includes component types of piping components and piping elements (e.g., level glass, restricting orifice, thermowell, valve body, etc.) but does not include piping (inadvertently included in 3.3.1-38 Oyster Creek Discussion), therefore, One-Time Inspection was not applied in accordance with the Oyster Creek aging management review methodology. The component type of piping was included in Line Items 3.3.1-39 and 3.3.1-42, therefore, One-Time Inspection was applied to confirm the absence of aging effects in low flow or stagnant flow areas in closed cooling water

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systems.
b) The One-Time Inspection program will be used to confirm the absence of aging effects in low flow or stagnant flow areas in closed cooling water systems (reference: PBD-AMP-B.1.24 for One-Time Inspection and PBD-AMP-B.1.14 for Closed Cycle Cooling Water Systems).

LRCR #: 266 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 2/ 7/2006

Reviewed By: Rafferty-Czincila, Shannon 2/ 7/2006

Approved By: Warfel, Don 2/ 7/2006

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Status: Closed

Topic:
Auxiliary Systems

Document References:
B.3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

3.3-10 Table 3.3.1 of the OCGS LRA, line item 3.3.1-64 addresses loss of material due to lining or coating degradation for steel components with a lining or coating exposed to raw water. GALL recommends that aging be managed with the open-cycle cooling water program and no further evaluation is recommended.
In the discussion of AMR line item 3.3.1-64, the LRA states that this AMR is not applicable since the presence of internal linings is conservatively not credited for corrosion protection. The justification is that degradation of internal coatings can contribute to potential downstream flow blockage, and NUREG-1801 Table IX.F, under the aging mechanism of fouling, states that reduction of system flow rate is considered active and thus not in the purview of license renewal. Therefore, credit is not being taken for internal coating inspections.
The justification provided for not inspecting internal coatings addresses only reduction of system flow rate. However, as noted in NUREG-1801, Table IX.F, macrofouling due to lining failure can also result in loss of material for the components with the failed lining, as well as reduction of heat transfer for heat exchangers upon which the failed linings are deposited. Please discuss how loss of material and reduction of heat transfer will be managed for systems containing components with failed linings.

Assigned To: Rafferty-Czincila, Shannon

Response:

The Open Cycle Cooling Water systems' activities include chemistry controls, performance monitoring and periodic inspections in order to control biofouling, verify heat transfer, monitor degradation of piping (loss of material) and protective coatings, and ensure compliance with the current licensing bases. (Ref. PBD-AMP-B.1.13, Section 3.1)
Oyster Creek has a test program to verify heat transfer capabilities. This is accomplished by performing heat transfer testing, operations monitoring of differential pressure across the heat exchangers, as an indication of fouling, and cleaning schedules that are within the guidance of GL 89-13 requirements. (Ref. PBD-AMP-B.1.13, Section 3.1.c)
The RBCCW & TBCCW heat exchangers are cleaned and inspected annually. The Containment Spray heat exchangers are cleaned and inspected every 3 years. The PM's for these cleaning and inspections will be enhanced to include inspection for loss of material due to general, pitting, crevice,

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galvanic and microbiologically influenced corrosion. (Ref. PBD-AMP-B.1.13, Section 3.1.c) Control or preventive measures such as chlorination treatment mitigates microbiologically influenced corrosion (MIC) and the buildup of macroscopic biological fouling species, such as blue mussels, oysters, or clams in the ESW & SW systems. Additionally, volumetric (UT) inspections are performed on the ESW & SW systems to detect loss of material. (Ref. PBD-AMP-B.1.13, Section 3.4)

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Rafferty-Czincila, Shannon 2/ 7/2006

Reviewed By: Miller, Mark 2/ 7/2006

Approved By: Warfel, Don 2/ 7/2006

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Item No
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Status: Closed

Topic:
Steam & Power Conversion

Document References:
3.4

NRC Representative Villaran, Mike

AmerGen (Took Issue): Hufnagel, Joh

Question

Question 3.4-1 Sections 3.4.2.2.5.1 of the OCGS LRA contain the further evaluation for loss of material for steel components exposed to raw water. GALL recommends that a plant specific program be implemented. The LRA states that the one-time inspection program (AMP B.1.24) will be implemented to manage loss of material for steel components exposed to a raw water-fresh water environment. Please discuss the OCGS operating experience for steel piping in a raw water environment, and provide the technical basis for concluding that the one-time inspection program alone is sufficient to manage loss of material for steel components exposed to raw water.

Assigned To: Getz, Stu

Response:

Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to manage the loss of material in steel piping and components exposed to a raw water - fresh water environment in the Drywell Floor and Equipment Drains System (DWED), Miscellaneous Floor and Equipment Drain System, Reactor Building Floor and Equipment Drains System, and in the Roof Drains and Overboard Discharge System. This program will confirm that loss of material is insignificant for non-safety related (NSR) piping and components of vents and drains, floor and equipment drains, and other systems and components that could contain a fluid, are not normally pressurized, and are in scope for 10CFR54.4(a)(2) for spatial interaction. The scope of the program consists of only those systems not covered by other aging management activities.

This program provides inspections that either verify that unacceptable degradation is not occurring or trigger additional actions that will assure the intended function of affected components will be maintained during the period of extended operation.

A review of the operating experience at Oyster Creek from 1/1/2000 to 7/22/2005 did not identify any age-related issues associated steel piping in a raw water - fresh water environment.

PIMS AR A2096529 does identify operating experience describing deterioration of a portion of a miscellaneous floor and equipment drain line located in the overhead region of the SE corner of the

turbine building basement. However, this deterioration is not the result of an aging-related issue with the carbon steel drain line material in a raw water-fresh water environment. Early in plant life, Oyster Creek performed on-site demineralizer regeneration, utilizing acid and caustic solutions. The subject drain line is located in the area where these regenerations were performed, and the drain line was exposed to acid and caustic drain solutions at that time. Oyster Creek no longer regenerates demineralizers on site, and this drain line is no longer used for routine drainage of equipment. The deterioration of the subject drain line was due to exposure to the acid and caustic solutions early in plant life, and not due to a raw water-fresh water environment.

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.

The document, "INSPECTION SAMPLE BASIS for Oyster Creek License Renewal Project," dated 08/16/2005, identifies criteria for selection of samples for the One-Time Inspection program. The inspection of steel piping for loss of material in the raw water-fresh water environment was selected as a "worse-case location" because carbon steel piping components such as flow glasses, strainer bodies, tanks, and valve bodies are robust in construction when compared to pipe and may not have a defined wall thickness baseline to compare against one-time inspection thickness results.

The inspection results will be evaluated by engineering for acceptability. Engineering will determine the rate at which the material is being lost. The results will be evaluated against predetermined limits such as design minimum wall thickness. Unacceptable results will be documented in the corrective action program. An extent of condition review, which is an integral part of the corrective action program, addresses the need to expand the inspection sample population if appropriate.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Getz, Stu 2/13/2006

Reviewed By: Miller, Mark 2/13/2006

Approved By: Warfel, Don 2/13/2006

NRC Acceptance (Date): 2/15/2006

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Item No
AMR-261

Date Received: 1/25/2006

Source AMR Audit

Status: Closed

Topic:
Steam & Power Conversion

Document References:
3.4

NRC Representative Villaran, Mike

AmerGen (Took Issue): Hufnagel, Joh

Question

Question 3.4-2Section 3.4.2.2.7.2 of the OCGS LRA contains the further evaluation for loss of material for stainless steel components exposed to raw water. The LRA states that the one-time inspection program (AMP B.1.24) will be implemented to manage loss of material for stainless steel components exposed to raw water. Please discuss the OCGS operating experience for stainless steel components in a raw water environment, and provide the technical basis for concluding that the one-time inspection program alone is sufficient to manage loss of material for stainless steel components exposed to raw water.

Assigned To: Corsi, Lou

Response:

Oyster Creek will implement a One-Time Inspection program, B.1.24, for susceptible locations to manage the loss of material in stainless steel piping and components exposed to a raw water - fresh water environment in the Drywell Floor and Equipment Drains System, Miscellaneous Floor and Equipment Drain System, and in the Reactor Building Floor and Equipment Drains System. The One-Time Inspection program confirms the absence of aging effects in pooled or potentially stagnant flow areas of drain piping and piping elements. This program will confirm that loss of material is insignificant for non-safety related (NSR) piping and components of vents and drains, floor and equipment drains, and other systems and components that could contain a fluid, and, are in scope for 10CFR54.4(a)(2) for spatial interaction. The scope of the program consists of only those systems not covered by other aging management activities

This program provides inspections that either verifies that unacceptable degradation is not occurring or trigger additional actions that will assure the intended function of affected components will be maintained during the period of extended operation.

A review of the operating experience at Oyster Creek from 1/1/2000 to 7/22/2005 did not identify any stainless steel age related issues associated with raw water - fresh water environments.

Since we have not identified any age related issues for stainless steel, the One-Time Inspection

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aging management program will not be used to inspect stainless steel drains but 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 for carbon steel drains. Per the "INSPECTION SAMPLE BASIS for Oyster Creek License Renewal Project" dated 08/16/2005, the inspection of stainless steel for loss of material is not required since stainless steel is more resistant to loss of material than carbon steel in this environment. Carbon steel piping was selected because carbon steel piping components such as flow glasses, strainer bodies, tanks, and valve bodies are robust in construction when compared to pipe and may not have a defined wall thickness baseline to compare against one-time inspection thickness results.

The inspection results will be evaluated by engineering for acceptability. Engineering will determine the rate at which the material is being lost. The results will be evaluated against predetermined limits such as design minimum wall thickness. Unacceptable results will be documented in the corrective action program. An extent of condition review, which is an integral part of the corrective action program, addresses the need to expand the inspection sample population if appropriate.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 2/ 3/2006

Reviewed By: Miller, Mark 2/ 8/2006

Approved By: Warfel, Don 2/ 8/2006

NRC Acceptance (Date): 2/15/2006

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Item No
AMR-283

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
Chlorination System

Status: Closed

Document References:
3.3.2.3.4

NRC Representative Davis, Jim

AmerGen (Took Issue):

<u>Question</u>

- LRA Table 3.3.2.1.5 line items - Question: For all of the above polypropylene, PVC, and CPVC components, are there any stressors such as ultraviolet, thermal, radiation, or ozone that would cause aging effects?

Assigned To: Micklo, Charles

<u>Response:</u>

The chlorination system has piping and valves constructed of PVC. They are located outdoors and are heat traced and insulated. The stressors listed are evaluated by Position Paper PP-15, Standard Materials, Environments, and Aging Effects. PP-15, Table 15 lists a change in material properties for PVC subject to irradiation, thermal exposure, ultraviolet radiation or ozone. The chlorination piping components fabricated from PVC are not subject to the listed stressors.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: Micklo, Charles 2/ 8/2006

Reviewed By: Miller, Mark 2/ 9/2006

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date):

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Source AMR Audit

Status: Closed

Topic:
Circulating Water System

Document References:
3.3.2.3.6

NRC Representative Davis, Jim

AmerGen (Took Issue): Hufnagel, Joh

Question

LRA Table 3.3.2.1.6 line items - Question: This AMP has a frequency of inspection of at least 10 years. What is the inspection frequency for this elastomer and is this based on manufacturer's recommendations and operating experience?

Assigned To: Corsi, Lou

Response:

The elastomer expansion joint in the Circulating Water System is internally subjected to a raw water - salt water environment, and aging is managed by the Periodic Inspection Program. The first inspection of component samples will be performed prior to the period of extended operation, with subsequent inspections at an interval not to exceed 10 years. Operating Experience has not indicated occurrences of any failure of the expansion joint due to aging effects. Due to this experience, the not-to-exceed-10-year interval was judged appropriate to confirm the continued absence of aging effects of the internal surfaces of the expansion joint.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 2/ 8/2006

Reviewed By: Rafferty-Czincila, Shannon 2/ 8/2006

Approved By: Warfel, Don 2/10/2006

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Status: Closed

Topic:
Containment Inerting System

Document References:
3.3.2.3.7

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.7 line items - Question: No aging effects are shown for steel components in a containment atmosphere is not consistent with the staff position presented in GALL Rev. 1.

Assigned To: Muggleston, Kevin

Response:

NUREG-1801 (GALL) Rev. 1 provides a definition for "Containment environment (inert)" in Section IX.D, but this environment is not referenced elsewhere in the GALL, so it is not clear what staff position this question is referring to. Note that this GALL definition erroneously refers to hydrogen as the inerting gas.

Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the NRC staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant's identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, loss of material due to corrosion is not a significant aging effect in the containment atmosphere environment.

During plant operation, plant technical specifications at Oyster Creek require oxygen levels to be maintained below 5%. Prior to startup following an outage where the primary containment was opened for maintenance activities, the drywell and torus are purged with nitrogen until oxygen levels are brought below the technical specification limit. A review of operating data indicates that the oxygen level continues to decrease over the next several weeks following startup, until the level falls below 1%. During the remainder of the operating cycle, the oxygen level is normally maintained below 1%.

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Based on a review of operating experience, significant surface corrosion of carbon steel mechanical system components inside the drywell has not been observed, except that surface corrosion has been identified in the Reactor Building Closed Cooling Water (RBCCW) system piping and an RBCCW system valve inside the drywell. The RBCCW system is supplied with chilled water during outage periods, and therefore uninsulated portions of the system are subject to condensation during outage operation. The identified RBCCW system surface corrosion has been evaluated under the Oyster Creek corrective action program, and it was determined that the system function was not affected. Wall thickness measurements indicate that the piping remains within nominal wall thickness specifications. Additional corrective actions are under evaluation.

It is now anticipated that periodic inspections of the uninsulated RBCCW piping inside the drywell will be required, to monitor for additional RBCCW system corrosion due to surface condensation during outage periods. Therefore, based on this operating experience, external surface inspections of uninsulated RBCCW system carbon steel components will be performed. These inspections will be included in the Structures Monitoring Program aging management program for license renewal.

The Containment Inerting system is not normally in service. The system piping is normally at ambient temperature conditions and not subject to surface condensation. A review of operating experience with this system does not indicate significant external surface corrosion of carbon steel system components inside the drywell. Therefore, for external surfaces of carbon steel mechanical system components inside the drywell, there are no aging effects requiring management.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/ 9/2006

Reviewed By: Miller, Mark 2/ 9/2006

Approved By: Warfel, Don 2/ 9/2006

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Status: Closed

Topic:
Control Rod Drive System

Document References:
3.3.2.3.9

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.9 line items - Question: No aging effects are shown for steel components in a containment atmosphere is not consistent with the staff position presented in GALL Rev. 1.

Assigned To: Muggleston, Kevin

Response:

NUREG-1801 (GALL) Rev. 1 provides a definition for "Containment environment (inert)" in Section IX.D, but this environment is not referenced elsewhere in the GALL, so it is not clear what staff position this question is referring to. Note that this GALL definition erroneously refers to hydrogen as the inerting gas.

Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the NRC staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant's identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, loss of material due to corrosion is not a significant aging effect in the containment atmosphere environment.

During plant operation, plant technical specifications at Oyster Creek require oxygen levels to be maintained below 5%. Prior to startup following an outage where the primary containment was opened for maintenance activities, the drywell and torus are purged with nitrogen until oxygen levels are brought below the technical specification limit. A review of operating data indicates that the oxygen level continues to decrease over the next several weeks following startup, until the level falls below 1%. During the remainder of the operating cycle, the oxygen level is normally maintained below 1%.

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Based on a review of operating experience, significant surface corrosion of carbon steel mechanical system components inside the drywell has not been observed, except that surface corrosion has been identified in the Reactor Building Closed Cooling Water (RBCCW) system piping and an RBCCW system valve inside the drywell. The RBCCW system is supplied with chilled water during outage periods, and therefore uninsulated portions of the system are subject to condensation during outage operation. The identified RBCCW system surface corrosion has been evaluated under the Oyster Creek corrective action program, and it was determined that the system function was not affected. Wall thickness measurements indicate that the piping remains within nominal wall thickness specifications. Additional corrective actions are under evaluation.

It is now anticipated that periodic inspections of the uninsulated RBCCW piping inside the drywell will be required, to monitor for additional RBCCW system corrosion due to surface condensation during outage periods. Therefore, based on this operating experience, external surface inspections of uninsulated RBCCW system carbon steel components will be performed. These inspections will be included in the Structures Monitoring Program aging management program for license renewal.

A review of Control Rod Drive system operating experience does not indicate significant external surface corrosion of carbon steel system components inside the drywell. Therefore, for external surfaces of carbon steel mechanical system components inside the drywell, there are no aging effects requiring management.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/ 9/2006

Reviewed By:

Approved By:

NRC Acceptance (Date):

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Status: Closed

Topic:
Control Room HVAC

Document References:
3.3.2.3.10

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.10 line items - Question: For all of the above polypropylene, PVC, and CPVC components, are there any stressors such as ultraviolet, thermal, radiation, or ozone that would cause aging effects?

Assigned To: Micklo, Charles

Response:

The Control Room HVAC system has an evaporate coil pan drain piping constructed from PVC pipe located outdoors. The stressors listed are evaluated by Position Paper PP-15, Standard Materials, Environments, and Aging Effects. PP-15, Table 15 lists a change in material properties for PVC subject to irradiation, thermal exposure, ultraviolet radiation or ozone. As identified in LRA Table 3.3.2.1.10, note 6, it is subject to ultraviolet radiation that can cause a change in material properties. The aging effect will be managed by the Periodic Inspection of Ventilation Systems aging management program.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Micklo, Charles 2/ 8/2006

Reviewed By: Miller, Mark 2/10/2006

Approved By: Warfel, Don 2/10/2006

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AMR-288	2/ 7/2006	AMR Audit
	Status:	Closed

Topic:
Cranes and Hoists

Document References:
3.3.2.3.11

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.8 line items - Question: How does this AMP inspect and manage loss of preload for bolts?

Assigned To: Ouaou, Ahmed

Response:

The Topic of this question is "Cranes and Hoists" but the refenced Table is 3.3.2.1.8 which is not for cranes and hoists but for "Containment Vacuum Breakers" system. The response below is given for cranes and hoists as evaluated in Table 3.3.2.1.11.

For cranes and hoists, proper preload is initially established by applying proper torque or tension in accordance with station procedures during installation or assembly. The AMP, Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handlings Systems (B.1.16) inspects and manages loss of preload by visual inspection of bolted connections for indication of loss of preload that includes loose or missing nuts and bolts.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By:	Ouaou, Ahmed	2/ 8/2006
Reviewed By:	Muggleston, Kevin	2/ 8/2006
Approved By:	Warfel, Don	2/ 8/2006

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Status: Closed

Topic:
Drywell Floor and Equipment Drains

Document References:
3.3.2.3.12

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.12 line items - Question: No aging effects for steel components in a containment atmosphere is not consistent with staff position presented in GALL Rev 1. Provide a basis for concluding that there are no aging effects.

Assigned To: Muggleston, Kevin

Response:

NUREG-1801 (GALL) Rev. 1 provides a definition for "Containment environment (inert)" in Section IX.D, but this environment is not referenced elsewhere in the GALL, so it is not clear what staff position this question is referring to. Note that this GALL definition erroneously refers to hydrogen as the inerting gas.

Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the NRC staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant's identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, loss of material due to corrosion is not a significant aging effect in the containment atmosphere environment.

During plant operation, plant technical specifications at Oyster Creek require oxygen levels to be maintained below 5%. Prior to startup following an outage where the primary containment was opened for maintenance activities, the drywell and torus are purged with nitrogen until oxygen levels are brought below the technical specification limit. A review of operating data indicates that the oxygen level continues to decrease over the next several weeks following startup, until the level fall below 1%. During the remainder of the operating cycle, the oxygen level is normally maintained

below 1%.

Based on a review of operating experience, significant surface corrosion of carbon steel mechanical system components inside the drywell has not been observed, except that surface corrosion has been identified in the Reactor Building Closed Cooling Water (RBCCW) system piping and an RBCCW system valve inside the drywell. The RBCCW system is supplied with chilled water during outage periods, and therefore uninsulated portions of the system are subject to condensation during outage operation. The identified RBCCW system surface corrosion has been evaluated under the Oyster Creek corrective action program, and it was determined that the system function was not affected. Wall thickness measurements indicate that the piping remains within nominal wall thickness specifications. Additional corrective actions are under evaluation.

It is now anticipated that periodic inspections of the uninsulated RBCCW piping inside the drywell will be required, to monitor for additional RBCCW system corrosion due to surface condensation during outage periods. Therefore, based on this operating experience, external surface inspections of uninsulated RBCCW system carbon steel components will be performed. These inspections will be included in the Structures Monitoring Program aging management program for license renewal.

The Drywell Floor and Equipment Drain system is normally at ambient temperature conditions and not subject to surface condensation. A review of operating experience with this system does not indicate significant external surface corrosion of carbon steel system components inside the drywell. Therefore, for external surfaces of carbon steel mechanical system components inside the drywell, there are no aging effects requiring management.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/ 9/2006

Reviewed By: Miller, Mark 2/10/2006

Approved By: Warfel, Don 2/10/2006

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NRC Information Request Form

Item No	*Date Received:*	*Source*
AMR-290	2/ 7/2006	AMR Audit
	Status:	Closed

Topic:
Emergency Diesel Generator and Auxiliary System

Document References:
3.3.2.3.13

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.13 line items Question: Would loss of material be an aging effect for brass heat exchanger (lube oil cooler) tubes in a close cooling water environment?

Assigned To: Micklo, Charles

Response:

The brass heat exchanger tubes for the EDG lube oil coolers with a closed cooling water environment are subject to loss of material aging effect associated with the pressure boundary intended function as listed in LRA Table 3.3.2.1.13. The aging effect is managed by the Closed-Cycle Cooling Water and the Selective Leaching of Materials aging management programs.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Micklo, Charles 2/ 8/2006

Reviewed By:

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-291

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
Emergency Service Water System

Status: Closed

Document References:
3.3.2.3.14

NRC Representative Davis, Jim

AmerGen (Took Issue): Hufnagel, Joh

Question

LRA Table 3.3.2.1.14 line items - Question: What is the frequency of inspection for loss of material of bolts in a raw/salt water environment?

Assigned To: Corsi, Lou

Response:

The Emergency Service Water System bolts subject to a raw/salt water environment are the Emergency Service Water pump casing bolts installed on the submerged portion of the pumps. In accordance with element 5 of PBD-AMP-B.1.12 the following monitoring applies:

ASME Class 1, 2 and 3 piping and component bolted joint inspection ISI schedules meet the requirements of ASME Section XI to ensure timely detection of applicable aging effects by inspecting for leakage or evidence of leakage during system pressure tests. If pressure retaining bolted joint connections are observed to be leaking, then the leakage is evaluated as part of the corrective action process.

Integrity of these submerged pump casing bolts is confirmed by quarterly inservice pump testing. Loss of material which leads to leakage is identified in pump performance testing. Pump maintenance activities are based on the results of this pump performance monitoring and trending. A review of operating experience in AMR-M-2.3.3.14 did not reveal performance degradation for submerged bolting issues.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Corsi, Lou 2/ 9/2006

Reviewed By: Muggleston, Kevin 2/10/2006

NRC Information Request Form

Approved By: Warfel, Don 2/14/2006

NRC Acceptance (Date): 2/14/2006

NRC Information Request Form

Item No	*Date Received:*	*Source*
AMR-292	2/ 7/2006	AMR Audit
	Status:	Closed

Topic:
Emergency Service Water System - LRA Table 3.3.2.1.14

Document References:
3.3.2.3.14

NRC Representative Davis, Jim

AmerGen (Took Issue): Hufnagel, Joh

Question

Loss of material for carbon and low alloy steel closure bolting in a soil environment is managed by the Bolting Integrity Program. Question: The Bolting Integrity program does not reference the Buried Piping Inspection program. How will this inspection be performed?

Assigned to Shannon/Lou

Assigned To: Corsi, Lou

Response:

The Bolting Integrity Program references the Buried Piping Inspection Program in PBD-AMP-B.1.12 in the Oyster Creek response to Element 3.1.a.
"Pressure retaining bolting may be subjected to various plant environmental conditions, including indoor air, outdoor air, buried or submerged environments. Inspection activities for bolting in a submerged environment are performed in conjunction with associated component maintenance activities. Inspection activities for bolting in a buried environment are performed in conjunction with buried piping and component inspections performed as part of the Buried Piping Inspection (B.1.26) aging management program."

Inspections for loss of material and loss of preload will be performed upon ten years after entering the period of extended operation, unless an opportunistic inspection occurs within this ten-year period, in accordance with the Buried Pipe Inspection frequencies.

The inspection of piping and bolting will be performed in accordance with procedure SA-AA-117 for Excavation, Trenching and Shoring. Detailed discussion of inspection results and frequency are provided in AMR-241.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Corsi, Lou	2/ 8/2006
Reviewed By:	Rafferty-Czincila, Shannon	2/ 6/2006
Approved By:	Warfel, Don	2/ 9/2006
NRC Acceptance (Date):	2/14/2006	

NRC Information Request Form

Item No
AMR-293

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
Emergency Service Water System - LRA Table 3.3.2.1.14

Status: Closed

Document References:
3.3.2.3.14

NRC Representative Davis, Jim

AmerGen (Took Issue): Hufnagel, Joh

Question

Loss of preload for carbon and low alloy steel closure bolting in soil environment is managed by the Bolting Integrity Program. Question: The Bolting Integrity program does not reference the Buried Piping Inspection program. How will this inspection be performed?

Assigned to Shannon/Lou

Assigned To: Corsi, Lou

Response:

The Bolting Integrity Program references the Buried Piping Inspection Program in PBD-AMP-B.1.12 in the Oyster Creek response to Element 3.1.a.
"Pressure retaining bolting may be subjected to various plant environmental conditions, including indoor air, outdoor air, buried or submerged environments. Inspection activities for bolting in a submerged environment are performed in conjunction with associated component maintenance activities. Inspection activities for bolting in a buried environment are performed in conjunction with buried piping and component inspections performed as part of the Buried Piping Inspection (B.1.26) aging management program."

Inspections for loss of material and loss of preload will be performed upon ten years after entering the period of extended operation, unless an opportunistic inspection occurs within this ten-year period, in accordance with the Buried Pipe Inspection frequencies.

The inspection of piping and bolting will be performed in accordance with procedure SA-AA-117 for Excavation, Trenching and Shoring. Detailed discussion of inspection results and frequency are provided in AMR-241.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Corsi, Lou	2/ 8/2006
Reviewed By:	Rafferty-Czincila, Shannon	2/ 8/2006
Approved By:	Warfel, Don	2/ 9/2006

NRC Acceptance (Date): 2/14/2006

NRC Information Request Form

Item No
AMR-294

Date Received: 2/ 7/2006

Source AMR Audit

Status: Closed

Topic:
Emergency Service Water System - LRA Table 3.3.2.1.14

Document References:
3.3.2.3.14

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

Change in material properties for elastomer expansion joint in a raw water (salt water) environment is managed by the Periodic Inspection Program. Question: This AMP has a frequency of inspection of at least 10 years. What is the inspection frequency for this elastomer and is this based on manufacturer's recommendations and operating experience?

Assigned To: Getz, Stu

Response:

The elastomer expansion joint in the Emergency Service Water System is internally subjected to a raw water (salt water) environment, and aging is managed by the Periodic Inspection Program.. The first inspection of component samples will be performed prior to the period of extended operation, with subsequent inspections at an interval not to exceed 10 years. Operating Experience has not indicated occurrences of any failure of the expansion joint due to aging effects. Due to this experience, the not-to-exceed-10-year interval was judged appropriate to confirm the continued absence of aging effects of the internal surfaces of the expansion joint.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Getz, Stu 2/ 8/2006

Reviewed By: Rafferty-Czincila, Shannon 2/ 8/2006

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date): 2/15/2006

NRC Information Request Form

Item No
AMR-295

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
Heating & Process Steam System

Status: Closed

Document References:
3.3.2.3.18

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

Change in material properties for polymer tanks in a boiler treated water environment is managed by the Periodic Inspection Program. Question: This AMP has a frequency of inspection of at least 10 years. What is the inspection frequency for this polymer and is this based on manufacturer's recommendations and operating experience?

Assigned To: Getz, Stu

Response:

The polymer chemical feed addition tanks for the Heating and Process Steam system are internally subjected to a boiler treated water environment, and aging is managed by the Periodic Inspection Program. The first inspection of component samples will be performed prior to the period of extended operation, with subsequent inspections at an interval not to exceed 10 years. Operating Experience has not indicated occurrences of any failure of these tanks due to aging effects. Due to this experience, the not-to-exceed-10-year interval was judged appropriate to confirm the continued absence of aging effects of the internal surfaces of these tanks.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Getz, Stu 2/ 8/2006

Reviewed By: Corsi, Lou 2/ 9/2006

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date): 2/15/2006

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMR-296		2/ 7/2006	AMR Audit
Topic:		***Status:***	Closed

Heading & Process Steam System

Document References:
3.3.2.3.18

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

Change in material properties for polymer tanks in an outdoor air environment is managed by the Structures Monitoring Program. Question: What is the inspection frequency for this polymer and is this based on manufacturer's recommendations and operating experience?

Assigned To: Getz, Stu

Response:

The polymer chemical feed addition tanks for the Heating and Process Steam system are externally subjected to an indoor air (external) environment, and aging is managed by the Structures Monitoring Program. The first inspection of component samples will be performed prior to the period of extended operation, with subsequent inspections at an interval not to exceed 4 years. Operating Experience has not indicated occurrences of any failure of these tanks due to aging effects. Due to this experience, the not-to-exceed-4-year interval was judged appropriate to confirm the continued absence of aging effects of the external surfaces of these tanks.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Getz, Stu	2/ 8/2006
Reviewed By:	Miller, Mark	2/10/2006
Approved By:	Warfel, Don	2/10/2006

NRC Acceptance (Date): 2/15/2006

NRC Information Request Form

Item No
AMR-297

Date Received: 2/ 7/2006

Source AMR Audit

Status: Closed

Topic:
Instrument (Control) Air System

Document References:
3.3.2.3.20

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.20 line items - Question: No aging effects for the above steel components in a containment atmosphere is not consistent with staff position presented in GALL Rev 1. Provide a basis for concluding that there are no aging effects.

Assigned To: Muggleston, Kevin

Response:

NUREG-1801 (GALL) Rev. 1 provides a definition for "Containment environment (inert)" in Section IX.D, but this environment is not referenced elsewhere in the GALL, so it is not clear what staff position this question is referring to. Note that this GALL definition erroneously refers to hydrogen as the inerting gas.

Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the NRC staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant's identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, loss of material due to corrosion is not a significant aging effect in the containment atmosphere environment.

During plant operation, plant technical specifications at Oyster Creek require oxygen levels to be maintained below 5%. Prior to startup following an outage where the primary containment was opened for maintenance activities, the drywell and torus are purged with nitrogen until oxygen levels are brought below the technical specification limit. A review of operating data indicates that the oxygen level continues to decrease over the next several weeks following startup, until the level fall below 1%. During the remainder of the operating cycle, the oxygen level is normally maintained

below 1%.

Based on a review of operating experience, significant surface corrosion of carbon steel mechanical system components inside the drywell has not been observed, except that surface corrosion has been identified in the Reactor Building Closed Cooling Water (RBCCW) system piping and an RBCCW system valve inside the drywell. The RBCCW system is supplied with chilled water during outage periods, and therefore uninsulated portions of the system are subject to condensation during outage operation. The identified RBCCW system surface corrosion has been evaluated under the Oyster Creek corrective action program, and it was determined that the system function was not affected. Wall thickness measurements indicate that the piping remains within nominal wall thickness specifications. Additional corrective actions are under evaluation.

It is now anticipated that periodic inspections of the uninsulated RBCCW piping inside the drywell will be required, to monitor for additional RBCCW system corrosion due to surface condensation during outage periods. Therefore, based on this operating experience, external surface inspections of uninsulated RBCCW system carbon steel components will be performed. These inspections will be included in the Structures Monitoring Program aging management program for license renewal.

The Instrument (Control) Air System inside the drywell is normally at ambient temperature conditions and not subject to surface condensation. A review of operating experience with this system does not indicate significant external surface corrosion of carbon steel system components inside the drywell. Therefore, for external surfaces of carbon steel mechanical system components inside the drywell, there are no aging effects requiring management.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/ 9/2006

Reviewed By:

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-298

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
Nitrogen Supply System - LRA Table 3.3.2.1.23 line items

Status: Closed

Document References:
3.3.2.3.23

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.23 line items - No aging effects for stainless steel heat exchangers (trim heater) in an encased environment. Question: For encased components, describe how the component is encased and are there any other environments such as moisture, etc... that could promote aging effects?

Assigned To: Miller, Mark

Response:

The subject heaters are Thermax Model TT-60 Thermacast trim heaters. Based on manufacturers information, the stainless steel heat transfer coils are cast into a solid aluminum block. There are no other environments that could promote aging effects.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Miller, Mark 2/ 8/2006

Reviewed By: Micklo, Charles 2/ 8/2006

Approved By: Warfel, Don 2/ 8/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No	*Date Received:*	*Source*
AMR-299	2/ 7/2006	AMR Audit
	Status:	Closed

Topic:
Nitrogen Supply System - LRA Table 3.3.2.1.23 line items

Document References:
3.3.2.3.23

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

No aging effects for stainless steel heat exchanger tubing (trim heater) in an encased environment
Question: For encased components, describe how the component is encased and are there any other environments such as moisture, etc... that could promote aging effects?

Assigned To: Miller, Mark

Response:

The subject heaters are Thermax Model TT-60 Thermacast trim heaters. Based on manufacturers information, the stainless steel heat transfer coils are cast into a solid aluminum block. There are no other environments that could promote aging effects.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Miller, Mark	2/ 8/2006
Reviewed By:	Micklo, Charles	2/ 8/2006
Approved By:	Warfel, Don	2/ 8/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-300

Date Received: 2/ 7/2006

Source AMR Audit

Status: Closed

Topic:
Reactor Building Closed Cooling Water System

Document References:
3.3.2.3.29

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.29 line items - Question: Is a one-time inspection performed to verify the effectiveness of the water chemistry program?

Assigned To: Miller, Mark

Response:

Closed Cycle Cooling Water Environment:
As stated in XI.M21, Closed Cycle Cooling Water System, the control of water chemistry does not preclude corrosion at locations of stagnant flow conditions. For Oyster Creek, the One-Time Inspection program will be used to confirm the absence of aging effects in low flow or stagnant flow areas in closed cooling water systems (reference: PBD-AMP-B.1.24 for One-Time Inspection and PBD-AMP-B.1.14 for Closed Cycle Cooling Water Systems). The One-Time Inspection in low or stagnant flow areas has been applied to the component type of piping only.

Treated Water Environment:
The draft January 2005 GALL did not include a requirement for One-Time Inspection to verify the effectiveness of the Water Chemistry program to manage the reduction of heat transfer. The September version of GALL does include this requirement. This difference has been evaluated for Oyster Creek. See Attachment 3, Item AP-62, of reconciliation document titled "Reconciliation of Program and Line Item Differences Between January 2005 Draft NUREG-1801 and September 2005 NUREG-1801 Revision 1" for the Oyster Creek Generating Station.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 2/ 8/2006

Reviewed By: Muggleston, Kevin 2/ 9/2006

NRC Information Request Form

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-301

Date Received: 2/ 7/2006

Source AMR Audit

Status: Closed

Topic:
Reactor Building Closed Cooling Water System

Document References:
3.3.2.3.29

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.29 line items - LRA page 3.3-300 contains a line item for heat exchangers (reactor building closed cooling water); however, the line is blank except for "Note 12." Question: The applicant should discuss why this row is blank.

Assigned To: Miller, Mark

Response:

As discussed in LRA methodology Section 2.1.6.1 for mechanical systems and heat exchangers/coolers:
· With the exception of heat exchangers and coolers that are in scope only for 10 CFR 54.4 (a)(2) spatial interactions, the materials, environments and aging effects on both sides of the heat transfer surfaces are evaluated with the system that performs the cooling function. This convention was chosen because the significant aging effects and associated aging management program activities are generally associated with the cooling system side.

The Reactor Building Closed Cooling Water Heat Exchangers are in scope for reasons other that 10 CFR 54.4. (a)(2) and, as such, are evaluated with the system that performs the cooling function (i.e., Service Water System). This is identified in plant specific note 12 of LRA Table 3.3.2.1.29 Reactor Building Closed Cooling Water. The materials, environments and aging effects on both sides of the heat transfer surfaces, and aging management programs, are identified in LRA Table 3.3.2.1.35 for the Service Water System.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Miller, Mark 2/ 8/2006

Reviewed By: Muggleston, Kevin 2/ 8/2006

NRC Information Request Form

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-302

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
Reactor Building Closed Cooling Water System

Status: Closed

Document References:
3.3.2.3.29

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.29 line items - Question: For the RBCCW System, there are no aging effects shown for steel components in a containment atmosphere. This is not consistent with the staff position presented in GALL Rev. 1.

Assigned To: Miller, Mark

Response:

Based on a review of operating experience, significant surface corrosion of carbon steel mechanical system components inside the drywell has not been observed, except that surface corrosion has been identified in the Reactor Building Closed Cooling Water (RBCCW) system piping and an RBCCW system valve inside the drywell. The RBCCW system is supplied with chilled water during outage periods, and therefore, uninsulated portions of the system are subject to condensation and an air environment conducive to corrosion during outage operation. The identified RBCCW system surface corrosion has been evaluated under the Oyster Creek corrective action program, and it was determined that the system function was not affected. Wall thickness measurements indicate that the piping remains within nominal wall thickness specifications. It is anticipated that periodic inspections of the uninsulated RBCCW piping inside the drywell will be required to monitor for additional RBCCW system corrosion due to surface condensation during outage periods. Therefore, based on this operating experience, external surface inspections of uninsulated RBCCW system carbon steel components within the drywell will be performed. These inspections will be included in the Structures Monitoring Program aging management program for license renewal. LRCR # 261 has been initiated to process the necessary changes to license renewal documents to address this change.

LRCR #: 261 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 2/ 8/2006

NRC Information Request Form

Reviewed By: Muggleston, Kevin 2/ 8/2006

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No	***Date Received:***	***Source***
AMR-303	2/ 7/2006	AMR Audit
Topic:	***Status:***	Closed

Reactor Building Ventilation System

Document References:
3.3.2.3.31

NRC Representative Davis, Jim

AmerGen (Took Issue):

<u>Question</u>

LRA Table 3.3.2.1.31 line items - Question: For components in concrete, describe how the component is encased in concrete and are there any other environments such as moisture, etc... that could promote aging effects?

Assigned To: Micklo, Charles

<u>Response:</u>

The Reactor Building Ventilation system contains aluminum duct in contact with concrete and subject to aging management review. Aluminum surfaces that were embedded in concrete or grout during installation are coated. The aluminum duct that is embedded is not subject to moisture. Remaining aluminum duct in the Reactor Building has an indoor air external environment. There are no aging effects for aluminum in indoor air.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By:	Micklo, Charles	2/ 8/2006
Reviewed By:	Muggleston, Kevin	2/ 9/2006
Approved By:	Warfel, Don	2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-304

Date Received: 2/ 7/2006

Source AMR Audit

Status: Closed

Topic:
Reactor Water Cleanup System

Document References:
3.3.2.3.32

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.32 - Question: No aging effects for steel components in a containment atmosphere is not consistent with staff position presented in GALL Rev 1. Provide a basis for concluding that there are no aging effects.

Assigned To: Muggleston, Kevin

Response:

NUREG-1801 (GALL) Rev. 1 provides a definition for "Containment environment (inert)" in Section IX.D, but this environment is not referenced elsewhere in the GALL, so it is not clear what staff position this question is referring to. Note that this GALL definition erroneously refers to hydrogen as the inerting gas.

Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the NRC staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant's identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, loss of material due to corrosion is not a significant aging effect in the containment atmosphere environment.

During plant operation, plant technical specifications at Oyster Creek require oxygen levels to be maintained below 5%. Prior to startup following an outage where the primary containment was opened for maintenance activities, the drywell and torus are purged with nitrogen until oxygen levels are brought below the technical specification limit. A review of operating data indicates that the oxygen level continues to decrease over the next several weeks following startup, until the level fall below 1%. During the remainder of the operating cycle, the oxygen level is normally maintained

below 1%.

Based on a review of operating experience, significant surface corrosion of carbon steel mechanical system components inside the drywell has not been observed, except that surface corrosion has been identified in the Reactor Building Closed Cooling Water (RBCCW) system piping and an RBCCW system valve inside the drywell. The RBCCW system is supplied with chilled water during outage periods, and therefore uninsulated portions of the system are subject to condensation during outage operation. The identified RBCCW system surface corrosion has been evaluated under the Oyster Creek corrective action program, and it was determined that the system function was not affected. Wall thickness measurements indicate that the piping remains within nominal wall thickness specifications. Additional corrective actions are under evaluation.

It is now anticipated that periodic inspections of the uninsulated RBCCW piping inside the drywell will be required, to monitor for additional RBCCW system corrosion due to surface condensation during outage periods. Therefore, based on this operating experience, external surface inspections of uninsulated RBCCW system carbon steel components will be performed. These inspections will be included in the Structures Monitoring Program aging management program for license renewal.

The Reactor Water Cleanup System is normally in service. The system piping inside the drywell is normally well above ambient temperature conditions and not subject to surface condensation. A review of operating experience with this system does not indicate significant external surface corrosion of carbon steel system components inside the drywell. Therefore, for external surfaces of carbon steel mechanical system components inside the drywell, there are no aging effects requiring management.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: Muggleston, Kevin 2/ 9/2006

Reviewed By:

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-305

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
Roof Drains and Overboard Discharge

Status: Closed

Document References:
3.3.2.3.33

NRC Representative Davis, Jim

AmerGen (Took Issue): Hufnagel, Joh

Question

LRA Table 3.3.2.1.33 line items - Question: The Bolting Integrity program does not reference the Buried Piping Inspection program. How will this inspection be performed?

Assigned To: Corsi, Lou

Response:

The Bolting Integrity Program references the Buried Piping Inspection Program in PBD-AMP-B.1.12 in the Oyster Creek response to Element 3.1.a.
"Pressure retaining bolting may be subjected to various plant environmental conditions, including indoor air, outdoor air, buried or submerged environments. Inspection activities for bolting in a submerged environment are performed in conjunction with associated component maintenance activities. Inspection activities for bolting in a buried environment are performed in conjunction with buried piping and component inspections performed as part of the Buried Piping Inspection (B.1.26) aging management program."
Inspections for loss of material and loss of preload will be performed upon ten years after entering the period of extended operation, unless an opportunistic inspection occurs within this ten-year period, in accordance with the Buried Pipe Inspection frequencies.
The inspection of piping and bolting will be performed in accordance with procedure SA-AA-117 for Excavation, Trenching and Shoring.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 2/ 8/2006

Reviewed By: Miller, Mark 2/10/2006

Approved By: Warfel, Don 2/10/2006

NRC Information Request Form

NRC Acceptance (Date): 2/14/2006

NRC Information Request Form

Item No
AMR-306

Date Received: 2/ 7/2006

Source AMR Audit

Status: Closed

Topic:
Roof Drains and Overboard Discharge

Document References:
3.3.2.3.33

NRC Representative Davis, Jim

AmerGen (Took Issue): Hufnagel, Joh

Question

LRA Table 3.3.2.1.33 line items - Loss of preload for carbon and low alloy steel closure bolting in a soil environment is managed by the Bolting Integrity Program. Question: The Bolting Integrity program does not reference the Buried Piping Inspection program. How will this inspection be performed?

Assigned To: Corsi, Lou

Response:

The Bolting Integrity Program references the Buried Piping Inspection Program in PBD-AMP-B.1.12 in the Oyster Creek response to Element 3.1.a.
"Pressure retaining bolting may be subjected to various plant environmental conditions, including indoor air, outdoor air, buried or submerged environments. Inspection activities for bolting in a submerged environment are performed in conjunction with associated component maintenance activities. Inspection activities for bolting in a buried environment are performed in conjunction with buried piping and component inspections performed as part of the Buried Piping Inspection (B.1.26) aging management program."
Inspections for loss of material and loss of preload will be performed upon ten years after entering the period of extended operation, unless an opportunistic inspection occurs within this ten-year period, in accordance with the Buried Pipe Inspection frequencies.
The inspection of piping and bolting will be performed in accordance with procedure SA-AA-117 for Excavation, Trenching and Shoring.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 2/ 8/2006

Reviewed By: Rafferty-Czincila, Shannon 2/ 8/2006

NRC Information Request Form

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date): 2/14/2006

NRC Information Request Form

Item No
AMR-307

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
RDODS System-Aging Effects for Polymer Piping and Fittings

Status: Closed

Document References:
3.3.2.3.33

NRC Representative Davis, Jim

AmerGen (Took Issue):

<u>Question</u>

LRA Table 3.3.2.1.33 line items - For the Roof Drains and Overboard Discharge System, there are no aging effects for polymer piping and fittings in a raw water and salt water environment Question: For polypropylene, PVC, and CPVC components, are there any stressors such as ultraviolet, thermal, radiation, or ozone that would cause aging effects?

Assigned To: Miller, Mark

<u>Response:</u>

The polymer piping material identified is described in plant specific note 7 of LRA Table 3.3.2.1.33 for the Roof Drains and Overboard Discharge System. The polymer piping is a polyester resin liner (Insituform) on the internal diameter of the 30" Overboard Discharge line. The polyester resin is only exposed to a raw water - salt water environment and is not exposed to stressors such as ultraviolet, thermal, radiation, or ozone that would cause aging effects. No aging effects are identified for the raw water - salt water environment as polyester resin is chemically resistant, has superior water resistance, and has no aging effects based on industry operating experience.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By:	Miller, Mark	2/ 8/2006
Reviewed By:	Rafferty-Czincila, Shannon	2/ 8/2006
Approved By:	Warfel, Don	2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-308

Date Received: 2/ 7/2006

Source AMR Audit

Status: Closed

Topic:
Sanitary Waste System

Document References:
3.3.2.3.34

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.34 line items - Question: For polypropylene, PVC, and CPVC components, are there any stressors such as ultraviolet, thermal, radiation, or ozone that would cause aging effects?

Assigned To: Micklo, Charles

Response:

The stressors listed are evaluated by Position Paper PP-15, Standard Materials, Environments, and Aging Effects. PP-15, Table 15 lists a change in material properties for PVC subject to irradiation, thermal exposure, ultraviolet radiation or ozone. The Sanitary Waste piping components fabricated from PVC are located indoors and not subject to the listed stressors that would cause aging effects.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Micklo, Charles 2/ 8/2006

Reviewed By: Miller, Mark 2/ 9/2006

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-309

Date Received: 2/ 7/2006
Source AMR Audit

Topic:
Service Water System

Status: Closed

Document References:
3.3.2.3.35

NRC Representative Davis, Jim

AmerGen (Took Issue): Hufnagel, Joh

Question

LRA Table 3.3.2.1.35 line items - Question: What is the frequency of inspection for loss of material of bolts in a raw/salt water environment?

Assigned to Shannon/Lou

Assigned To: Corsi, Lou

Response:

The Service Water System bolts subject to a raw/salt water environment are the Service Water pump casing bolts installed on the submerged portion of the pumps. In accordance with element 5 of PBD-AMP-B.1.12 the following monitoring applies:

ASME Class 1, 2 and 3 piping and component bolted joint inspection ISI schedules meet the requirements of ASME Section XI to ensure timely detection of applicable aging effects by inspecting for leakage or evidence of leakage during system pressure tests. Non-ASME Class 1, 2 and 3 system bolted joint inspections focus on monitoring the station systems for visible leakage during normal plant operation, or by inspection for evidence of leakage during performance of periodic system maintenance. If pressure retaining bolted joint connections are observed to be leaking, then the leakage is evaluated as part of the corrective action process.

Integrity of these submerged pump casing bolts is confirmed by quarterly inservice pump testing. Loss of material which leads to leakage is identified in pump performance testing. Pump maintenance activities are based on the results of this pump performance monitoring and trending. A review of operating experience in AMR-M-2.3.3.35 did not reveal performance degradation for submerged bolting issues.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Corsi, Lou	2/ 9/2006
Reviewed By:	Muggleston, Kevin	2/10/2006
Approved By:	Warfel, Don	2/12/2006
NRC Acceptance (Date):	2/14/2006	

NRC Information Request Form

Item No
AMR-310

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
Service Water System - LRA Table 3.3.2.1.35 line items

Status: Closed

Document References:
3.3.2.3.35

NRC Representative Davis, Jim

AmerGen (Took Issue): Hufnagel, Joh

Question

Loss of material for carbon and low alloy steel closure bolting in a soil environment is managed by the Bolting Integrity Program. Question: The Bolting Integrity program does not reference the Buried Piping Inspection program. How will this inspection be performed?

Assigned to Shannon/Lou

Assigned To: Corsi, Lou

Response:

The Bolting Integrity Program references the Buried Piping Inspection Program in PBD-AMP-B.1.12 in the Oyster Creek response to Element 3.1.a.
"Pressure retaining bolting may be subjected to various plant environmental conditions, including indoor air, outdoor air, buried or submerged environments. Inspection activities for bolting in a submerged environment are performed in conjunction with associated component maintenance activities. Inspection activities for bolting in a buried environment are performed in conjunction with buried piping and component inspections performed as part of the Buried Piping Inspection (B.1.26) aging management program."
Inspections for loss of material and loss of preload will be performed upon ten years after entering the period of extended operation, unless an opportunistic inspection occurs within this ten-year period, in accordance with the Buried Pipe Inspection frequencies.
The inspection of piping and bolting will be performed in accordance with procedure SA-AA-117 for Excavation, Trenching and Shoring.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Corsi, Lou 2/ 8/2006

NRC Information Request Form

Reviewed By: Rafferty-Czincila, Shannon 2/ 8/2006

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date): 2/14/2006

NRC Information Request Form

Item No	*Date Received:*	*Source*
AMR-311	2/ 7/2006	AMR Audit
	Status:	Closed

Topic:
Service Water System - LRA Table 3.3.2.1.35 line items

Document References:
3.3.2.3.35

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

Change in material properties for elastomer expansion joints in a raw water-salt water environment is managed by the Periodic Inspection Program. Question: This AMP has a frequency of inspection of at least 10 years. What is the inspection frequency for this elastomer and is this based on manufacturer's recommendations and operating experience?

Assigned To: Micklo, Charles

Response:

The elastomer expansion joint in the Service Water System is internally subjected to a raw water (salt water) environment, and aging is managed by the Periodic Inspection Program. The first inspection of component samples will be performed prior to the period of extended operation, with subsequent inspections at an interval not to exceed 10 years. Operating Experience has not indicated occurrences of any failure of the expansion joint due to aging effects. Due to this experience, the not-to-exceed-10-year interval was judged appropriate to confirm the continued absence of aging effects of the internal surfaces of the expansion joint.

Note, the external surfaces of the elastomeric expansion joints are managed by the Structures Monitoring aging management program which has an inspection frequency of every 4 years.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Micklo, Charles 2/ 8/2006

Reviewed By: Getz, Stu 2/ 9/2006

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

Item No
AMR-312

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
Service Water System - LRA Table 3.3.2.1.35 line items

Status: Closed

Document References:
3.3.2.3.35

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

No aging effects for polyvinyl chloride (PVC & CPVC) valve body in an outdoor air environment. No aging effects for polyvinyl chloride (PVC & CPVC) valve body in a raw water-salt water environment. Question: For all of the above polypropylene, PVC, and CPVC components, are there any stressors such as ultraviolet, thermal, radiation, or ozone that would cause aging effects?

Assigned To: Miller, Mark

Response:

Polyvinyl Chloride (PVC, CPVC) material in an outdoor air (external) environment is the identified material/environment combination for piping and fittings, strainer bodies, and valve bodies associated with the service water radiation monitoring skid of the Service Water System (reference: Drawing LR-BR-2005, sheet 2, coordinate C/F-2/3). All polyvinyl chloride material located outside is insulated and heat traced and is not exposed to stressors such as ultraviolet, thermal, radiation, or ozone that would cause aging effects. See Plant Specific note 6 associated with LRA Table 3.3.2.1.35.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Miller, Mark 2/ 8/2996

Reviewed By: Rafferty-Czincila, Shannon 2/ 8/2006

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-313

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
Shutdown Cooling System

Status: Closed

Document References:
3.3.2.3.36

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.36 line items - LRA page 3.3-368 contains a line item for coolers (shutdown cooling pumps); however, the line is blank except for "Note 14." Question: The applicant should discuss why this row is blank.

Assigned To: Getz, Stu

Response:

As discussed in LRA methodology Section 2.1.6.1 for mechanical systems and heat exchangers/coolers:

"'With the exception of heat exchangers and coolers that are in scope only for 10 CFR 54.4 (a)(2) spatial interactions, the materials, environments and aging effects on both sides of the heat transfer surfaces are evaluated with the system that performs the cooling function. This convention was chosen because the significant aging effects and associated aging management program activities are generally associated with the cooling system side."

The Shutdown Cooling Pumps coolers (LRA page 3.3-368) are in scope for reasons other that 10 CFR 54.4. (a)(2) and, as such, are evaluated with the system that performs the cooling function (i.e., Reactor Building Closed Cooling Water System). This is identified in plant specific note 14 of LRA Table 3.3.2.1.36, Shutdown Cooling System. The materials, environments and aging effects on both sides of the heat transfer surfaces, and aging management programs, are identified in LRA Table 3.3.2.1.29 for the Reactor Building Closed Cooling Water System (LRA pages 3.3-293 and 3.3-294).

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Getz, Stu 2/ 8/2006

NRC Information Request Form

Reviewed By: Corsi, Lou 2/ 9/2006

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No	*Date Received:*	*Source*
AMR-314	2/ 7/2006	AMR Audit
	Status:	Closed

Topic:
Shutdown Cooling System - LRA Table 3.3.2.1.36 line items

Document References:
3.3.2.3.36

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA page 3.3-370 contains a line item for heat exchangers (shutdown cooling); however, the line is blank except for "Note 15." Question: The applicant should discuss why this row is blank.

Assigned To: Getz, Stu

Response:

As discussed in LRA methodology Section 2.1.6.1 for mechanical systems and heat exchangers/coolers:

"With the exception of heat exchangers and coolers that are in scope only for 10 CFR 54.4 (a)(2) spatial interactions, the materials, environments and aging effects on both sides of the heat transfer surfaces are evaluated with the system that performs the cooling function. This convention was chosen because the significant aging effects and associated aging management program activities are generally associated with the cooling system side."

The Shutdown Cooling Heat Exchangers (LRA page 3.3-370) are in scope for reasons other that 10 CFR 54.4. (a)(2) and, as such, are evaluated with the system that performs the cooling function (i.e., Reactor Building Closed Cooling Water System). This is identified in plant specific note 15 of LRA Table 3.3.2.1.36, Shutdown Cooling System. The materials, environments and aging effects on both sides of the heat transfer surfaces, and aging management programs, are identified in LRA Table 3.3.2.1.29 for the Reactor Building Closed Cooling Water System (LRA pages 3.3-300 and 3.3-301).

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Getz, Stu 2/ 8/2006

Reviewed By: Corsi, Lou 2/ 9/2006

NRC Information Request Form

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-315

Date Received: 2/ 7/2006

Source AMR Audit

Status: Closed

Topic:
Spent Fuel Pool Cooling

Document References:
3.3.2.3.36

NRC Representative Davis, Jim

AmerGen (Took Issue): Hufnagel, Joh

Question

No aging effects for aluminum heat exchangers (augmented fuel pool cooling and fuel pool cooling) in a concrete environment. Question: For components in concrete, describe how the component is encased and are there any other environments such as moisture, etc... that could promote aging effects?

Assigned To: Micklo, Charles

Response:

There are no aluminum heat exchangers in the spent fuel pool cooling system embedded in a concrete environment. Aluminum components in a concrete environment at Oyster Creek are coated and the two materials are not in direct contact.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: Micklo, Charles 2/13/2006

Reviewed By: Muggleston, Kevin 2/13/2006

Approved By: Warfel, Don

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMR-316		2/ 7/2006	AMR Audit
Topic:		***Status:***	Closed

Shutdown Cooling System - LRA Table 3.3.2.1.36 line items

Document References:

3.3.2.3.36

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

Question: No aging effects for steel components in a containment atmosphere is not consistent with staff position presented in GALL Rev 1. Provide a basis for concluding that there are no aging effects.

Assigned To: Muggleston, Kevin

Response:

NUREG-1801 (GALL) Rev. 1 provides a definition for "Containment environment (inert)" in Section IX.D, but this environment is not referenced elsewhere in the GALL, so it is not clear what staff position this question is referring to. Note that this GALL definition erroneously refers to hydrogen as the inerting gas.

Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the NRC staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant's identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, loss of material due to corrosion is not a significant aging effect in the containment atmosphere environment.

During plant operation, plant technical specifications at Oyster Creek require oxygen levels to be maintained below 5%. Prior to startup following an outage where the primary containment was opened for maintenance activities, the drywell and torus are purged with nitrogen until oxygen levels are brought below the technical specification limit. A review of operating data indicates that the oxygen level continues to decrease over the next several weeks following startup, until the level fall below 1%. During the remainder of the operating cycle, the oxygen level is normally maintained

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below 1%.

Based on a review of operating experience, significant surface corrosion of carbon steel mechanical system components inside the drywell has not been observed, except that surface corrosion has been identified in the Reactor Building Closed Cooling Water (RBCCW) system piping and an RBCCW system valve inside the drywell. The RBCCW system is supplied with chilled water during outage periods, and therefore uninsulated portions of the system are subject to condensation during outage operation. The identified RBCCW system surface corrosion has been evaluated under the Oyster Creek corrective action program, and it was determined that the system function was not affected. Wall thickness measurements indicate that the piping remains within nominal wall thickness specifications. Additional corrective actions are under evaluation.

It is now anticipated that periodic inspections of the uninsulated RBCCW piping inside the drywell will be required, to monitor for additional RBCCW system corrosion due to surface condensation during outage periods. Therefore, based on this operating experience, external surface inspections of uninsulated RBCCW system carbon steel components will be performed. These inspections will be included in the Structures Monitoring Program aging management program for license renewal.

The Shutdown Cooling System is not normally in service. The system piping is normally at ambient temperature conditions and not subject to surface condensation. A review of operating experience with this system does not indicate significant external surface corrosion of carbon steel system components inside the drywell. Therefore, for external surfaces of carbon steel mechanical system components inside the drywell, there are no aging effects requiring management.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/ 9/2006

Reviewed By: Miller, Mark 2/10/2006

Approved By: Miller, Mark 2/10/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-317

Date Received: 2/ 7/2006

Source AMR Audit

Status: Closed

Topic:
Water Treatment & Distribution System

Document References:
3.3.2.3.41

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

- LRA Table 3.3.2.1.41 line items - No aging effects for polymers (plastic) filter housing (including purifier M-12-1) in an indoor air environment. Question: For this polymer component, are there any stressors such as ultraviolet, thermal, radiation, or ozone that would cause aging effects?

Assigned To: Micklo, Charles

Response:

The stressors listed are evaluated by Position Paper PP-15, Standard Materials, Environments, and Aging Effects. PP-15, Table 15 lists a change in material properties for PVC subject to irradiation, thermal exposure, ultraviolet radiation or ozone. The Water Treatment & Distribution system filter housing fabricated from a plastic polymer is located indoors and not subject to the listed stressors that would cause aging effects.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

Prepared By: Micklo, Charles 2/ 8/2006

Reviewed By: Miller, Mark 2/ 9/2006

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-318

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
Water Treatment & Distribution System

Status: Closed

Document References:
3.3.2.3.41

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.41 line items - No aging effects for polymers (plastic) filter housing (including purifier M-12-1) in a treated water environment. Question: For this polymer component, are there any stressors such as ultraviolet, thermal, radiation, or ozone that would cause aging effects?

Assigned To: Micklo, Charles

Response:

The stressors listed are evaluated by Position Paper PP-15, Standard Materials, Environments, and Aging Effects. PP-15, Table 9 lists a change in material properties for polymers subject to thermal exposure in a treated water environment. The Water Treatment & Distribution system filter housing fabricated from a plastic polymer contains treated water not subject to the thermal stressor that would cause aging effects.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Micklo, Charles	2/ 8/2006
Reviewed By:	Miller, Mark	2/ 9/2006
Approved By:	Warfel, Don	2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-319

Date Received: 2/ 7/2006

Source AMR Audit

Status: Closed

Topic:
Water Treatment & Distribution System

Document References:
3.3.2.3.41

NRC Representative Davis, Jim

AmerGen (Took Issue):

Question

LRA Table 3.3.2.1.41 line items - Question: No aging effects for steel components in a containment atmosphere is not consistent with staff position presented in GALL Rev 1. Provide a basis for concluding that there are no aging effects.

Assigned To: Muggleston, Kevin

Response:

NUREG-1801 (GALL) Rev. 1 provides a definition for "Containment environment (inert)" in Section IX.D, but this environment is not referenced elsewhere in the GALL, so it is not clear what staff position this question is referring to. Note that this GALL definition erroneously refers to hydrogen as the inerting gas.

Based on past precedence (NUREG-1796, Dresden and Quad Cities SER, paragraph 3.1.2.4.1), the NRC staff concluded that the loss of material due to corrosion is not considered a credible aging effect for carbon steel components in a containment nitrogen environment because of negligible amounts of free oxygen (less than 4 percent by volume during normal operation). Both oxygen and moisture must be present for general corrosion to occur because oxygen alone or water free of dissolved oxygen (high humidity in a nitrogen atmosphere) does not corrode carbon steel to any practical extent. The staff found the applicant's identification of no loss of material for the carbon steel components exposed to a containment nitrogen environment acceptable because, with the negligible amounts of free oxygen, anodic reactions do not take place and the corrosion cell does not form. Therefore, loss of material due to corrosion is not a significant aging effect in the containment atmosphere environment.

During plant operation, plant technical specifications at Oyster Creek require oxygen levels to be maintained below 5%. Prior to startup following an outage where the primary containment was opened for maintenance activities, the drywell and torus are purged with nitrogen until oxygen levels are brought below the technical specification limit. A review of operating data indicates that the oxygen level continues to decrease over the next several weeks following startup, until the level fall below 1%. During the remainder of the operating cycle, the oxygen level is normally maintained

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below 1%.

Based on a review of operating experience, significant surface corrosion of carbon steel mechanical system components inside the drywell has not been observed, except that surface corrosion has been identified in the Reactor Building Closed Cooling Water (RBCCW) system piping and an RBCCW system valve inside the drywell. The RBCCW system is supplied with chilled water during outage periods, and therefore uninsulated portions of the system are subject to condensation during outage operation. The identified RBCCW system surface corrosion has been evaluated under the Oyster Creek corrective action program, and it was determined that the system function was not affected. Wall thickness measurements indicate that the piping remains within nominal wall thickness specifications. Additional corrective actions are under evaluation.

It is now anticipated that periodic inspections of the uninsulated RBCCW piping inside the drywell will be required, to monitor for additional RBCCW system corrosion due to surface condensation during outage periods. Therefore, based on this operating experience, external surface inspections of uninsulated RBCCW system carbon steel components will be performed. These inspections will be included in the Structures Monitoring Program aging management program for license renewal.

The Water Treatment and Distribution System inside the drywell is not normally in service. The only portion of this system in the drywell that is in scope is the piping connected to the containment penetration. This Water Treatment and Distribution System in only placed in service inside the drywell during outage periods. During normal operation, the system is isolated from the drywell by removal of spool pieces at the containment penetration, and installing blank flanges. The piping is drained and is at ambient temperature conditions and not subject to surface condensation. A review of operating experience with this system does not indicate significant external surface corrosion of carbon steel system components inside the drywell. Therefore, for external surfaces of carbon steel mechanical system components inside the drywell, there are no aging effects requiring management.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: Muggleston, Kevin 2/ 9/2006

Reviewed By: Miller, Mark 2/10/2006

Approved By: Warfel, Don 2/10/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMR-320		2/ 7/2006	AMR Audit
Topic:		***Status:***	Void

Structural AMR

Document References:
FRCTS-1

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

Based on review of (1) Table 3.6.1C (structural AMR Table 1) and Table 3.6.2.1.2C (structural AMR Table 2) in the applicant's October 12, 2005 response to RAI 2.5.1.19-1, and (2) the revised commitments and LRA Appendix B write-up for the Structures Monitoring Program (SMP) AMP in the applicant's November 11, 2005 response to RAI 2.5.1.19-1, the following clarification is needed:

Assigned To: Ouaou, Ahmed

Response:

This is a duplicate of AMR-321. Void.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:

Reviewed By:

Approved By: To Be Assigned

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-321

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
SMP AMP

Status: Closed

Document References:
FRCTS-1

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

Based on review of (1) Table 3.6.1C (structural AMR Table 1) and Table 3.6.2.1.2C (structural AMR Table 2) in the applicant's October 12, 2005 response to RAI 2.5.1.19-1, and (2) the revised commitments and LRA Appendix B write-up for the Structures Monitoring Program (SMP) AMP in the applicant's November 11, 2005 response to RAI 2.5.1.19-1, the following clarification is needed:

Table 1 indicates that the SMP AMP will be used for aging management of steel bolting (in lieu of the Bolting Integrity AMP) and elastomer fire barrier penetration seals (in lieu of the Fire Protection AMP). Structural bolting and seals and gaskets are listed in Table 2. The SMP AMP is credited, with Note E. Please specifically document these enhancements to the SMP AMP, and include them in the related list of commitments.

Assigned To: Muggleston, Kevin

Response:

Table 3.6.1C and Table 3.6.2.1.2C in the October 12, 2005 response to RAI 2.5.1.19-1 indicate that the Structures Monitoring Program will be used to manage aging of Station Blackout System (FRCT) structural bolting. These tables also indicate that the Structures Monitoring Program will be used to manage aging of Station Blackout System (FRCT) structural seals and gaskets. Although Table 3.6.1C Item 3.3.1-46 describes the component as fire barrier penetration seals, this component description is the GALL description and not the Oyster Creek description. As indicated in the Discussion/Further Evaluation column, this Item is being applied to structural seals and gaskets and not to fire barrier penetration seals. Table 3.6.2.1.2B in the November 11, 2005 response to RAI 2.5.1.19-1 indicates that the Structures Monitoring Program will be used to manage aging of Station Blackout System (FRCT) duct closure bolting.

These commitments are documented in the Structures Monitoring Program basis document PBD-AMP-B.1.31, and also on the A.5 License Renewal Commitment List (Structures Monitoring Program commitment 31.12 and 31.13) submitted with the November 11, 2005 response to RAI 2.5.1.19-1.

LRCR #:

LRA A.5 Commitment #:

NRC Information Request Form

IR#:

Approvals:

Prepared By:	Muggleston, Kevin	2/ 8/2006
Reviewed By:	Ouaou, Ahmed	2/ 8/2006
Approved By:	Warfel, Don	2/ 8/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-322

Date Received: 2/ 7/2006
Source AMR Audit

Topic:
FRCT

Status: Void

Document References:
FRCTS-2

NRC Representative Morante, Rich

AmerGen (Took Issue):

Question

Notes 1 and 2 at the end of Structural Table 2 (Table 3.6.2.1.2C in the applicant's October 12, 2005 response to RAI 2.5.1.19-1) describe unique structural features of the FRCT.

Assigned To: Ouaou, Ahmed

Response:

Duplicate of AMR-323 and 324. Void.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:

Reviewed By:

Approved By: To Be Assigned

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-323

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
Operating Experience

Status: Closed

Document References:
FRCTS-2

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

Question

Notes 1 and 2 at the end of Structural Table 2 (Table 3.6.2.1.2C in the applicant's October 12, 2005 response to RAI 2.5.1.19-1) describe unique structural features of the FRCT.

(a) Please provide information related to operating experience for the water-jacketed combustion turbine support legs and for the wood foundation piles/foundation.

Assigned To: Muggleston, Kevin

Response:

(a) The combustion turbine support legs are structural members designed with an internal section that allows cooling water to flow through the inside of the support. Adequate cooling is demonstrated by the combustion turbine ability to maintain proper alignment. There is no operating experience that indicates degrading structural or heat transfer functions of these support legs.

The wooden piles are inaccessible. The turbine support foundation has not shown signs of cracking or distortion due to increased stress levels from settlement that could result from degradation of the wooden piles.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/ 8/2006

Reviewed By: Ouaou, Ahmed 2/ 8/2006

Approved By: Warfel, Don 2/ 8/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-324

Date Received: 2/ 7/2006

Source AMR Audit

Topic:
Aging Management Program

Status: Closed

Document References:
FRCTS-2

NRC Representative Morante, Rich

AmerGen (Took Issue): Hufnagel, Joh

__Question__

Notes 1 and 2 at the end of Structural Table 2 (Table 3.6.2.1.2C in the applicant's October 12, 2005 response to RAI 2.5.1.19-1) describe unique structural features of the FRCT.

(b) Describe the aging management program that is credited for the interior (wetted) surfaces of the support legs. (Note 1 states that the AMP will be provided later.) Has the scope of the selected AMP been enhanced to identify the FRCT support legs?

Assigned To: Muggleston, Kevin

__Response:__

(b) The water-cooled turbine support legs are identified as "Heat Exchangers (Support Leg)" in Table 3.6.2.1.2B that was submitted in the November 11, 2005 response to RAI 2.5.1.19-1. This table indicates that the Closed-Cycle Cooling Water System - FRCT (B.1.14A) aging management program is credited for managing the Reduction of Heat Transfer and Loss of Material aging effects on the internal wetted surfaces. These components have been included in this AMP. See Table 5.2 of Program Basis Document AMP-PBD-B.1.14A.

LRCR #: *LRA A.5 Commitment #:*

IR#:

__Approvals:__

Prepared By: Muggleston, Kevin 2/ 8/2006

Reviewed By: Ouaou, Ahmed 2/ 8/2006

Approved By: Warfel, Don 2/ 8/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMR-325		2/ 7/2006	AMR Audit
Topic:		***Status:***	Closed
34.5 kV Cables			

Document References:
AMP 222

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

34.5 kV cables associated with FRCTs are not identified in LRA B.1.36 AMP. However, PBD reflects these cables. (Ref. App. D, RAI -2.5.19-1). Why is this not identified in LRA AMP B.136 and A.136.

Assigned To: Spamer, Deb

Response:

The scope and evolution of the scope of the Oyster Creek B.1.36 Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements aging management program is reflected in two documents. The first is the January 22, 2006 Oyster Creek document that reconciles the Oyster Creek LRA, prepared to the January 2005 draft revision of NUREG-1801, to the September 2005 revision 1 of NUREG-1801. The second is the associated program basis document PBD-AMP-B.1.36.

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The B.1.36 line item in Attachment 1 of the reconciliation document states:

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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 (which addresses the Station Blackout System Electrical Commodities). 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. LRA Impact: Revision required to reflect the inclusion of 34.5 kV cables.

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The program basis document states in both the program description and scope of program sections:

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Inclusion of the 13.8 kV system circuits in this program reflects the scope expansion of the Station Blackout System electrical commodities at the Forked River Combustion Turbine power plant. Inclusion of the 34.5 kV system circuits in this program reflects a change in scope for reconciliation of this new aging management program from the draft January 2005 GALL to the approved September

NRC Information Request Form

2005 GALL.

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Note: The 34.5 kV circuits are associated with the offsite power feeds via the start-up transformers at Oyster Creek and are not associated with the Forked River Combustion Turbines. The Forked River Combustion Turbines electrical commodities include the 13.8 kV circuits discussed above.

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The program basis document attachments include 3 revisions of the Appendix A and Appendix B for B.1.36:

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1 As submitted in the LRA

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2 As submitted in the 10/12/05 RAI 2.5.1.19-1 response

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3 As drafted for revision based on changes made for reconciliation to the September 2005 revision 1 of NUREG-1801, which have already been incorporated into the program basis document.

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The B.1.36 program basis document was written incorporating the program changes as a result of the station blackout RAI 2.5.1.19-1 response and the the September 2005, revision 1 to NUREG-1801. As a result the scope of the Oyster Creek B.1.36 program was increased to include:

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1 13.8 kV circuits associated with the Forked River Combustion Turbine power plant, and

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2 In-scope license renewal 34.5 kV cables associated with offsite power feeds to the Oyster Creek electrical distribution systems, as shown in license renewal boundary drawing LR-BR-3000.

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LRCR 267 has been initiated to track and implement License Renewal documentation changes to reflect the B.1.36 scope that includes 2.4 kV, 4.16 kV, 13.8 kV and 34.5 kV circuits.

LRCR #: 267 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Spamer, Deb 2/ 8/2006

Reviewed By: Muggleston, Kevin 2/ 8/2006

Approved By: Warfel, Don 2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No	*Date Received:*	*Source*
AMR-326	2/ 7/2006	AMR Audit
Topic:	*Status:*	Closed

Medium Voltage Cables

Document References:
AMP 224

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

__Question__

What is the commitment number to supplement LRA to capture trending of the test results of medium voltage cables through the period of extended operation.

Assigned To: Spamer, Deb

__Response:__

Passport assignment 330592.36 documents and tracks closure of the implementing procedures for B.1.36 as delineated in the LRA and associated program basis document. The LRCR for Question AMP-224 is tracking revision to the PBD for trending of cable test results. The change to the PBD will be implemented in procedures and work orders tracked by Passport sub-assignments 330592.36.01 and 330592.36.03.

LRCR #: *LRA A.5 Commitment #:*

IR#:

__Approvals:__

Prepared By:	Spamer, Deb	2/ 8/2006
Reviewed By:	Muggleston, Kevin	2/ 8/2006
Approved By:	Warfel, Don	2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMR-327		2/ 7/2006	AMR Audit
Topic:		***Status:***	Closed

Document References:
AMP 160

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

LRA page B-94 does not reflect the enhancements discussed in PBD B.1.35 for elements 3, 4, and 5. Why are these enhancements reflected in LRA for these elements as discussed in PBD 1.35?

Assigned To: Spamer, Deb

Response:

The Appendix A and Appendix B information in the Oyster Creek LRA both identify that the Oyster Creek B.1.35 program is an existing program that will add, as recommended by NUREG-1801 Section XI.E2, a review of cable testing results for cable aging degradation. This review will be performed prior to the period of extended operation and every 10 years thereafter. The review of cable test results is cited in the last sentence of the third paragraph of the program description for B.1.35 on LRA page B-94. The review of cable test results is cited as an enhancement to B.1.35 on LRA page B-95.

Program basis document PBD-AMP-B.1.35 identified this enhancement to an existing program in sections 3.3, 3.4 and 3.5 (as is discussed in audit question AMP-160). It is appropriate to link a review of cable testing results to the aging management program elements for parameters monitored (#3), detection of aging effects (#4) and monitoring and trending (#5).

No document revisions are warranted.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Spamer, Deb	2/ 8/2006
Reviewed By:	Muggleston, Kevin	2/ 8/2006

NRC Information Request Form

Approved By: Warfel, Don 2/ 8/2006

NRC Acceptance (Date):

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Item No		*Date Received:*	*Source*
AMR-328		2/ 7/2006	AMR Audit
Topic:		*Status:*	Closed

Aging Management Program

Document References:

AMR 3.6.2.1.1

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

__Question__

Aging management program for item number 3.6.1.1 is identified as B.139. Is it 1.39 or B.3.0.2? NUREG 1801 recommends further evaluation by a TLAA. Is TLAA established ?

Assigned To: Spamer, Deb

__Response:__

Item 3.6.1-1 of Table 3.6.1 identifies that EQ equipment is evaluated by a TLAA in Section 4.4 of the LRA. Section 4.4 identifies that the OC EQ program (B.3.2) used to manage EQ components at Oyster Creek. Appendix B.3.2 also identifies the OC EQ Program is to maintain the qualified life of EQ components. Section 4.4 states that the calculations performed to maintain the qualified life of EQ components are TLAAs, and that they have been evaluated for 60 years. Furthermore, a search of the OC LRA did not find a reference to B.139 or B.1.39.

LRCR #: *LRA A.5 Commitment #:*

IR#:

__Approvals:__

Prepared By:	May, Mike	2/ 8/2006
Reviewed By:	Spamer, Deb	2/ 8/2006
Approved By:	Warfel, Don	2/ 9/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-329

Date Received: 2/13/2006

Source AMR Audit

Status: Accepted by NRC

Topic:
Reactor Vessel, Internals and Reactor Coolant System

Document References:
3.1

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

1.In LRA Section 3.1.2.2.2.2, the applicant states that an augmented program, in addition to the water chemistry and ASME Section XI ISI programs, is credited to manage loss of material due to general, pitting and crevice corrosion in the SS isolation condenser components. In LRA Section 3.1.2.2.4.3, the applicant also states that the water chemistry and ASME Section XI ISI programs, and the same augmented program manage cracking due to stress corrosion cracking (SCC), including intergranular stress corrosion cracking (IGSCC), and cyclic loading in both CS and SS isolation condenser components.
(a) Please provide results for the most recent augmented inspections performed on the isolation condenser components.
(b) Provide the frequency of this inspection program, and any other relevant information related to detecting the above aging effects in both CS and SS isolation condenser components.

Assigned To: Getz, Stu

Response:

(a) The additional augmented inspections have not yet occurred, consequently results are not available.

(b) Sections 3.1.2.2.2.2 and 3.1.2.2.4.3 of the LRA state that the ASME Section XI Inservice Inspection program will be enhanced to perform inspection of the isolation condenser tube side components, including temperature and radioactivity monitoring of the shell-side water, eddy current testing of the tubes, and inspection (VT or UT) of the tubesheet and channel head to ensure that significant degradation is not occurring and the component function will be maintained during the extended period of operation. The eddy current inspection of tubes and VT or UT inspection of the tube sheet and channel head will be performed during the first ten years of the period of extended operation. This inspection schedule is based on the tube bundles having been replaced with new bundles utilizing upgraded materials that are more resistant to intergranular stress corrosion cracking. The tube bundles were replaced due to leaks resulting from a combination of fatigue and TGSCC. The tube bundles in the Oyster Creek "A" isolation condenser were replaced in 2000, and the tube bundles in the "B" isolation condenser were replaced in 1998. Passport commitment

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tracking item No. 330592.01.03 tracks the creation and revision of the work order for the augmented inspection activities.

The temperature and radioactivity monitoring of the shell side water will be proceduralized and begun prior to the period of extended operation. Passport commitment tracking item No. 330592.01.01 documents this activity.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Getz, Stu 2/15/2006

Reviewed By: Corsi, Lou 2/16/2006

Approved By: Warfel, Don 2/16/2006

NRC Acceptance (Date): 2/16/2006

NRC Information Request Form

Item No
AMR-330

Date Received: 2/13/2006

Source AMR Audit

Topic:
Reactor Vessel, Internals and Reactor Coolant System

Status: Closed

Document References:
3.1

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

In accordance with SRP Section 3.1.2.2.2.3, the GALL Report recommends further evaluation of programs to manage the loss of material due to pitting and crevice corrosion for SS, nickel alloy, and steel with SS or nickel alloy cladding flanges, nozzles, penetrations, pressure housings, safe ends, and vessel shells, heads and welds exposed to reactor coolant to verify the effectiveness of the chemistry control program. A one-time inspection of select components at susceptible locations is an acceptable method.
(a) Please confirm that the one-time inspection program (B.1.24) is used to ensure that corrosion is not occurring in the above reactor components.
(b) Also, confirm that the selection of susceptible locations is based on severity of conditions, time of service, and lowest design margin; and provide the inspection techniques to be used in the one-time inspection program.

Assigned To: May, Mike

Response:

The aging effects described in of GALL line item RP-25 (Section 3.1.2.2.2.3) will be managed through the use of the Water Chemistry and One-Time Inspection programs. The selection of susceptible locations for one-time inspection will be based on severity of conditions, time of service, and lowest design margin. In general inspections will be performed using VT-1 where appropriate. This issue will be further evaluated and reconciled in AMR-355.

LRCR #:

LRA A.5 Commitment #:

IR#:

Approvals:

Prepared By: May, Mike 2/16/2006

Reviewed By: Getz, Stu 2/16/2006

NRC Information Request Form

Approved By: Warfel, Don

NRC Acceptance (Date):

NRC Information Request Form

Item No		***Date Received:***	***Source***
AMR-331		2/13/2006	AMR Audit
Topic:		***Status:***	Closed

Reactor Vessel, Internals and Reactor Coolant System -top gu

Document References:

3.1

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

In PBD-AMP-B.1.8, the applicant states that cracking of the top guide was first detected in 1994 at OCGS. Subsequent inspections in 1996, 2000, and 2004 have tracked cracking growth in the top guide. Flaw evaluations have been performed to ensure the top guide is acceptable for continued operation and to schedule future inspections. Also, note 6 to LRA Table 3.1.2.1.4 states that the top guide has exceeded the IASCC threshold; and the BWR vessel internals AMP indicates an enhancement to monitor the cracking within next 12 years. In LRA Table 3.1.2.1.4, the BWR vessel internals and water chemistry aging management programs are credited to manage cracking in the top guide. In the light of past experience with cracking of the reactor vessel top guide, please provide the technical basis for concluding that the BWR vessel internals (with the enhancement) and water chemistry program are adequate to manage this aging effect for this component. Include any augmented inspections that are being performed now or are planned to be performed during the period of extended operation.

Assigned To: May, Mike

Response:

AMR-331 Top Guide

1.History - Several NRC information notices address cracking of BWR top guides within the operating experience of domestic and foreign reactors. During the 13R refueling outage in 1991, Oyster Creek found a crack on the underside of a top guide beam. During the 14R and 15R refueling outages in 1992 and 1994, additional cracks were discovered on the underside of top guide beams. As a result of these findings, UT inspections were performed for the complete top guide during the 16R refueling outage in 1996. This comprehensive inspection identified 5 mid-span cracks and 12 UT indications in the notches used to interlock the beams. The majority of the cracks and indications were located in the NE quadrant of the top guide. Additionally, a sample of the top guide was removed for metallurgical examination during the 16R refueling outage and the aging mechanism was determined to be irradiation-assisted stress corrosion cracking (IASCC). Furthermore, a flaw growth evaluation was prepared for the most significant crack to predict future crack growth and to evaluate its effects upon structural integrity of the top guide. The flaw evaluation predicted a

maximum crack growth of 1.6 inches within two cycles of operation and determined that even if this occurred, the structural integrity of the Top Guide would not be compromised.

2. Effectiveness - Visual inspections of the Top Guide were performed again during the 18R refueling outage in 2000. The visual inspection of the limiting flaw determined that it had grown approximately half of the maximum predicted crack growth value during the two operating cycles since the previous inspection. The crack was still well within evaluated limits and did not impair the structural integrity of the top guide. Additional visual inspections were made during the 20R refueling outage in 2004 to monitor crack growth. These inspections indicated that there was no additional crack growth during the previous two operating cycles.

3. Current Program – During the 20R refueling outage in 2006, the top guide will be inspected using UT examination methods. As a minimum, the complete NE quadrant of the top guide will be inspected to determine if the cracking has been mitigated. If significant crack growth is identified in the NE quadrant, additional inspections will be performed as necessary to characterize crack growth.

4. Period of Extended Operation - Since the fluence at the top guide has exceeded the IASCC threshold ten (10) percent of the top guide locations will be inspected using enhanced visual inspection technique, EVT-1 within 12 years, with one-half of the inspections (5 percent of locations) to be completed within 6 years. These inspections will be performed in accordance with the guidelines of BWRVIP-26-A. In addition, identified flaws will be evaluated in accordance with BWRVIP guidelines. Corrective actions will be taken, including repair or replacement of the Top Guide if required.

5. As discussed in BWRVIP-26-A, Oyster Creek is a lead plant with respect to top guide cracking due to its age and top guide fluence. Therefore, the results of the 2006 inspections will provide key information in developing top guide inspection guidelines, and the frequency and scope of future inspections may be adjusted based on these inspection results. This program provides reasonable assurance that the top guide will perform its intended functions during the period of extended operation.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: May, Mike 2/16/2006

Reviewed By: Corsi, Lou 2/17/2006

Approved By: Warfel, Don

NRC Acceptance (Date):

NRC Information Request Form

Item No	***Date Received:***	***Source***
AMR-332	2/13/2006	AMR Audit
	Status:	Closed

Topic:
Reactor Vessel, Internals and Reactor Coolant - core shroud

Document References:
3.1

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

In PBD-AMP-B.1.8, the applicant states that OCGS repaired the core shroud with 10 tie rods anchored to the top and bottom of the shroud in 1994. Subsequent inspections in 1996 found some crack indications in V-9, which were dispositioned as acceptable. In 1998, additional vertical welds were inspected using both enhanced visual and UT methodologies. In 2000, inspections of vertical welds did not find any additional indications of cracking. In LRA Table 3.1.2.1.4, the BWR vessel internals and water chemistry aging management programs are credited to manage cracking in the core shroud.
(a) Please provide inspection results for the last two inspections of the core shroud and discuss the current condition of the core shroud.
(b) Based on past operating experience, what is the technical basis for concluding that the BWR vessel internals and water chemistry AMPs are adequate for maintaining its structural integrity during period of extended operation? Include any augmented inspections that are being performed now or are planned to be performed during the period of extended operation.

Assigned To: May, Mike

Response:

AMR-332 Core Shroud

1. History - Review of industry experience has confirmed that cracking has been observed in core shrouds at both horizontal (Nuclear Regulatory Commission [NRC] Generic Letter [GL] 94 03) and vertical (NRC Information Notice [IN] 97 17) welds. It has affected shrouds fabricated from Type 304 and Type 304L SS. In 1994 Oyster Creek performed a comprehensive examination of the shroud and discovered signiifcant cracking in the core shroud H4 circumferential weld. Additional minor cracking was found in the H2 and H6 welds. The examinations consisted of visual examinations with cleaning and UT exams wherever practical. During the same refueling outage shroud repair hardware was installed to ensure the shroud could continue to perform its intended function. The repair consisted of 10 tie rods anchored at the top and bottom of the shroud. Details of the repair design were sent to the NRC in 1994. The shroud repair system structurally replaces all horizontal welds. Therefore, as discussed BWRVIP-76, no further inspection of the horizontal welds is

required. Subsequent inspections focused on the vertical welds.

2. Effectiveness - Subsequent inspections of the repair hardware have confirmed that the tie rods are in good condition and continue to provide reliable structural support for the shroud. Following the guidelines of BWRVIP-76, Oyster Creek has chosen to implement the option to inspect all vertical welds. The accessible length of all vertical welds was inspected in 1998 and 2000. All inspected welds were found free of indications, except the V-9. Weld indicated a small flaw (less than 2"), which was acceptable using the acceptance criteria of BWRVIP-76.

3. Current Program - Oyster Creek will complete inspection of all vertical welds in accordance with BWRVIP-76 guidelines by 2008. Currently, the vertical welds are scheduled to be inspected using UT exam techniques in 2006.

4. Period of Extended Operation - For the period of extended operation, the inspections identified above will be continued in accordance with BWRVIP-76 guidelines. All vertical welds will be inspected every ten years using either EVT-1 or UT examination methods. Repair assemblies will be inspected using VT-3 of locking devices, critical gap or contact areas, bolting and the overall component. The repair anchorage inspections include an EVT-1 inspection of the most highly stressed accessible load bearing weld every 10 years. If indications are identified, they will be evaluated and appropriate corrective actions will be taken. This program provides reasonable assurance that the core shroud will perform its intended functions during the period of extended operation.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: May, Mike 2/17/2006

Reviewed By: 2/17/2006

Approved By: Warfel, Don 2/17/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No	*Date Received:*	*Source*
AMR-333	2/13/2006	AMR Audit
Topic:	*Status:*	Closed

Reactor Vessel, Internals and Reactor Coolant CS sparger

Document References:

3.1

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

IE Bulletin 80-13 states that the core spray sparger at OCGS has experienced cracking since 1978. Clamps were installed to maintain the structural integrity of the sparger. In LRA Table 3.1.2.1.4, the BWR vessel internals and water chemistry aging management programs are credited to manage cracking in the core spray sparger.
(a) Please discuss the current status of the structural integrity of the core spray sparger and provide inspection results for the last two inspections.
(b) Based on past operating experience, what is the technical basis for concluding that the BWR vessel internals and water chemistry AMPs are adequate for maintaining its structural integrity during period of extended operation? Include any augmented inspections that are being performed now or are planned to be performed during the period of extended operation.

Assigned To: May, Mike

Response:

333 - Core Spray Spargers

1) History - Instances of cracking in BWR core spray spargers have been reviewed in NRC Bulletin 80-13. In 1978, Oyster Creek identified crack indications in the Core Spray Spargers. One mechanical clamp was installed during that refueling outage to provide structural support for a crack identified in one of the core spray spargers. The installed clamp ensures long-term structural integrity of the sparger, but no credit is taken as a leakage limiter.

In 1980, additional linear indications were reported. As a result of the indications, nine additional mechanical clamps were installed. All four tee boxes on both spargers were clamped. The primary root cause of the cracking problems identified in 1978 and 1980 was reported to be high residual stresses from forcing the sparger pipes into position during installation. Consistent with this root cause, the cracking was expected to relieve the residual stresses and stop any further growth, as well as the initiation of new cracks. No further cracking or other degradation of the spargers has been reported since 1980.

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2) Effectiveness - Recent inspections in 1998, 2000, 2002, and 2004 have confirmed that the repair clamps are in good condition. Inspection of the core spray piping welds has confirmed that the mitigation efforts provided by the Reactor Water Chemistry program have been successful, as no new crack indications have been found.

3) Current Program - The core spray piping and spargers inside the reactor vessel at Oyster Creek are inspected in accordance with BWRVIP-18-A, which specifies inspection of core spray internals, including piping, spargers, nozzles, and brackets. There are no ASME Section XI requirements for the Core Spray Internals. As prescribed by BWRVIP-18-A, during each refueling outage, the following components are evaluated using EVT-1 enhanced visual examination methods: accessible core spray piping fillet welds; 25% of the core spray piping brackets; 25% of the core spray piping butt welds; end cap welds; and T-box cover plate welds. The following components are examined using VT-1 visual examination methods during each refueling outage: Nozzle-to-Pipe welds, Nozzle-to-Orifice welds, sparger brackets, and repair clamps.

4) Future Program - For the period of extended operation, the inspections identified above will be continued in accordance with BWRVIP-18-A guidelines. If indications are identified, they will be evaluated and appropriate corrective actions will be taken. This program provides reasonable assurance that the core spray system will perform its intended functions during the period of extended operation

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: May, Mike 2/17/2006

Reviewed By: Miller, Mark 2/17/2006

Approved By: Warfel, Don 2/17/2006

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-334

Date Received: 2/13/2006

Source AMR Audit

Topic:
Reactor Vessel, Internals and Rx Coolant System - Stub Tube

Status: Closed

Document References:
3.1

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

In LRA Section B.1.9, the applicant states that there are two leaking CRD stub tubes that were repaired by using a roll expansion method. In LRA Table 3.1.2.1.5, the BWR vessel internals (with the enhancement) and water chemistry aging management programs are credited to manage cracking in the CRD stub tubes.
(a) Please discuss the current status of the structural integrity of these two repaired as well as all other CRD stub tubes and provide their recent inspection results.
(b) Based on past operating experience, what is the technical basis for concluding that the BWR vessel internals and water chemistry AMPs are adequate for maintaining the structural integrity of CRD stub tubes during the period of extended operation? Include any augmented inspections that are being performed now or are planned to be performed during the period of extended operation.

Assigned To: May, Mike

Response:

334 - Incore Housings & CRD Stub Tube Penetrations

1. History - During the 4R refueling outage in 1974, one spare incore housing was repaired at location 28-05 by roll expansion. During the 18R refueling outage in 2000, while performing the RPV pressure test, leakage was observed from CRD housing locations 42-43 and 46-39 at the bottom head interface. The stub tube welds to these CRD housings were found to be cracked and leaking. A roll expansion repair design was engineered in accordance with BWRVIP-17. UT inspections were performed inside the CRD housings where they meet the bottom head and also in the bore area of the upper J weld between the CRD housings and the top of the stub tubes. No indications were identified in any of these locations. CRD Housing locations 42-43 and 46-39 were roll expansion repaired and the leakage was stopped. A post-repair UT inspection was performed to verify that the rolling did not damage the CRD housing material. No indications were found in the roll expansion repair area of either core location.

2. Effectiveness - The spare incore housing that had been roll expansion repaired in 1974 was last inspected in 1983 and no further indication of degradation was found. No signs of leakage have

been identified for this repaired incore housing since the roll repair was performed. This showed the effectiveness of the roll expansion repair method.

During the 19R refueling outage in 2002, the two CRD stub tube penetrations that had been roll expansion repaired in 2000 were reinspected by removing one control rod guide tube to allow access to the lower plenum area of the RPV. No cracking were identified. No undervessel leakage was observed from these locations. These inspections demonstrated that the roll expansion repairs have been effective in sealing the penetrations and preventing leakage.

Current Program - BWRVIP-47 indicates that inspection of the stub tubes and CRD housings is not required. However, BWRVIP-17 specifies in-service inspection requirements for all roll-expanded CRD housings. ASME Section XI specifies inspection requirements for the reactor vessel pressure boundary. A VT-2 visual examination is performed during the RPV pressure test to satisfy the requirements of ASME Section XI. The examinations are performed at the nominal operating pressure of the Class 1 pressure boundary. Due to the stub tube leakage in the bottom head identified in 2000, Oyster Creek has committed to perform inspections for leakage whenever the drywell is made accessible during outages. Currently a minimal amount of leakage is permitted for rolled repaired housing. This leakage allowance is valid only through the next refueling outage (2006). If the ASME Code N-730 case is approved and adopted at Oyster Creek, then weld repairs will be made for leaking stub tubes that cannot be made leak tight using a roll repair prior to restarting the plant.

4. Oyster Creek is pursuing Code Case N-730 within ASME to make these roll expansion repairs permanent. Once the ASME and NRC approve the code case, the Oyster Creek BWR Reactor Internals Program will be revised to make these repairs permanent. If Code Case N-730 is not approved, the program will be changed to require weld repair for the previously roll expansion repaired components prior to the period of extended operation.

4. Future Program - The current program will be continued during the period of extended operation in accordance with the requirements of the approved Code Case N-730. If Code Case N-730 is not approved, the current program will be continued except any leaking components will be weld repaired. Inspections for leakage will be performed in accordance with the requirements of the Code case. VT-2 visual examinations will be performed during the RPV pressure test to satisfy the requirements of ASME Section XI. If leakage is detected on a CRD housing the leakage will be stopped using a roll expansion repair, provided the code case is approved at that time. If leakage from a stub tube can not be stopped with an approved roll repair, a weld repair will be made prior to plant restart.
If the code case is not approved, an ASME and NRC approved weld repair will be made. UT examinations of roll repaired CRD housings bore will be made in accordance with the requirements of the Code case.

The Oyster Creek Reactor Internals Program specifies appropriate inspection requirements to identify aging effects for the Incore Housings and CRD Stub Tube Penetrations and specifies corrective actions to mitigate these aging effects. This program provides reasonable assurance that these components will continue to perform their intended functions through the period of extended

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operation.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: May, Mike 2/16/2006

Reviewed By: Corsi, Lou 2/16/2006

Approved By: Warfel, Don

NRC Acceptance (Date):

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Item No
AMR-335

Topic:

Date Received: 2/13/2006

Source AMR Audit

Status: Accepted by NRC

Document References:
3.2

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

1.In LRA Section 3.2.2.2, the applicant provides the basis for identifying those programs that warrant further evaluation for the Engineered Safety Features (ESF) systems. This section of the LRA does not address all material-environment-aging effect (MEA) combinations identified in the corresponding section in the SRP-LR. Please discuss the following MEA combinations as applicable to the ESF systems:
a. Loss of material due to pitting and crevice corrosion in SS containment isolation piping, piping components, and piping elements exposed to treated water (SRP-LR Section 3.2.2.2.3.1). Note that LRA Table 3.2.1-3 addresses SS piping, piping components, and piping elements exposed to treated water, and also discusses isolation condenser SS tubes and tube side components.
b. Loss of material due to pitting and crevice corrosion in SS piping, piping components, and piping elements exposed to treated water (SRP-LR Section 3.2.2.2.3.3). Note that LRA Table 3.2.1-10 addresses CS and aluminum piping, piping components, and piping elements exposed to treated water.
c. Loss of material due to pitting and crevice corrosion in SS piping, piping components, and piping elements exposed to lubricating oil (SRP-LR Section 3.2.2.2.3.4). Note that LRA Table 3.2.1-37 addresses CS and copper alloy piping, piping components, and piping elements exposed to lubricating oil (no water pooling). Also, LRA Table 3.2.1-34 indicates no aging effect for SS piping, piping components, and piping elements exposed to lubricating oil consistent with GALL (is this true? See LRA Table 3.3.1-27).
d. Reduction in heat transfer due to fouling in CS, SS, and copper alloy HX tubes exposed to lubricating oil (SRP-LR Section 3.2.2.2.4.1).
e. Reduction in heat transfer due to fouling in SS HX tubes exposed to treated water on either side (SRP-LR Section 3.2.2.2.4.2). Note that LRA Table 3.2.1-24 addresses SS HX tubes exposed to treated water, and credits the water chemistry program and the SRP-LR Table 3.2.1, item 10 requires both water chemistry and one time inspection AMPs.
f. Loss of material due to general, pitting and crevice corrosion in CS piping, piping components, and piping elements (including containment isolation systems) exposed to treated water (SRP-LR Section 3.2.2.2.8.2).
g. Loss of material due to general, pitting and crevice corrosion, in CS piping, piping components, and piping elements exposed to lubricating oil (SRP-LR Section 3.2.2.2.8.3).
h.loss of material due to MIC of external surfaces in buried CS (with or without coating or wrapping)

piping, piping components, and piping elements exposed to treated water (SRP-LR Section 3.2.2.2.9). Note that LRA Section 3.2.2.2.8.3 (and LRA Table 3.2.1-12) addresses this aging effect due to general, pitting, and crevice corrosion buried in soil and identifies that no buried CS tanks in the ESF systems in the scope of LR. Also, SRP-LR requires demonstration of effectiveness of the buried piping inspection program (B.1.26).

Assigned To: Getz, Stu

Response:

A number of the material-environment-aging effect (MEA) combinations identified in the September 2005 Revision 1 SRP are new to that document and were not included in the January 2005 Draft SRP which was used in generating the Oyster Creek License Renewal Application (LRA). Other MEA combinations identified in the September 2005 Revision 1 SRP were also included in the January 2005 Draft SRP, but were not used in the Oyster Creek LRA, either because the MEA combination does not exist at Oyster Creek, or because an alternate Table 2 Related Item Number was used. The Oyster Creek License Renewal document, "Reconciliation of Program and Line Item Differences Between January 2005 Draft NUREG-1801 and September 2005 NUREG-1801 Revision 1", and the Oyster Creek "Roadmap" Excel table can provide information to correlate the September 2005 Revision 1 SRP with the Oyster Creek LRA.

a. The September 2005 Revision 1 SRP changed line item E-33 to apply specifically to SS containment isolation piping in a treated water environment, and now specifies Water Chemistry and One-Time Inspection as the AMPs to be used, in lieu of a plant-specific program as specified in the January 2005 draft SRP. The Oyster Creek LRA specifies this same line item E-33 for SS piping and components in a treated water environment, and lists the Water Chemistry and One-Time Inspection aging management programs, in accordance with the September 2005 Revision 1 SRP. Line Item EP-32 is also used in the Oyster Creek LRA for loss of material due to pitting and crevice corrosion in SS piping and components in containment isolation piping in a treated water environment. This line item, which specified plant-specific programs in the January 2005 draft SRP and now specifies Water Chemistry and One-Time Inspection programs in the September 2005 Revision 1 SRP, is used at Oyster Creek with the aging management programs of Water Chemistry and One-Time Inspection, in accordance with the SRP. Line items E-33 and EP-32 are both addressed in Oyster Creek LRA Table 3.2.1-3 and Section 3.2.2.2.3.1.

The ASME Section XI ISI program is also applied as an additional program under EP-32 specifically for loss of material in the Isolation Condenser SS tubes. Reference LRA Section 3.2.2.2.3.1.

b. Loss of material due to pitting and crevice corrosion in SS piping, piping components, and piping elements in a treated water environment are addressed by Oyster Creek LRA line Item EP-32, Table 3.2.1-3, LRA Section 3.2.2.2.3.1.

c. Line items EP-45 and EP-51 addressed in the September 2005 Revision 1 SRP (SRP Section 3.2.2.2.3.4) are new line items not contained in the January 2005 draft SRP used in preparing the Oyster Creek LRA. This MEA combination is not present in ESF systems at Oyster Creek. The

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Oyster Creek LRA addresses loss of material in SS in a lubricating oil environment with line items AP-59 (LRA Section 3.3.2.2.12.2) and SP-38 (LRA Section 3.4.2.2.8). For ESF systems, Oyster Creek LRA Table item 3.2.1-34 (EP-21) indicates no aging effect for SS piping, piping components, and piping elements in a lubricating oil environment. This is consistent with the January 2005 draft SRP, Table 3.2-1 item 34 which indicates that for stainless steel piping, piping components, and piping elements exposed to lubricating oil, the Aging Effect/Mechanism is "None" and Aging Management Programs are "None". LRA Table 3.2.1, Item 3.2.1-34 will be revised in a supplement to state that the MEA is not applicable to the Oyster Creek ESF systems. Reference LRCR No. 272

d. September 2005 Revision 1 SRP Section 3.2.2.2.4.1 addresses line items EP-40, EP-47, and EP-50, which are all new line items added to the September 2005 Revision 1 of the SRP and were not included in the January draft SRP. Consequently, these items were not used in the Oyster Creek LRA. This MEA combination is not present in ESF systems at Oyster Creek. The Oyster Creek LRA used the Lubricating Oil Monitoring Activities (B.2.2) program for reduction of heat transfer in aluminum heat exchanger fins, cast iron bearing cooler housings, and copper alloy heat exchanger tubes exposed to a lubricating oil environment in the EDG, RBCCW, and Fire Protection Systems. The January 2005 draft SRP did not contain these MEA combinations, therefore plant-specific notes were applied to these line items.

e. Reference the Reconciliation document, Page 10, and Attachment 3. September 2005 Revision 1 SRP Section 3.2.2.2.4.2 addresses line item EP-34. 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.

f. Please reference the response to AMR-248 for a discussion of SRP Section 3.2.2.2.8.2. For this MEA in the Oyster Creek ESF systems, the Oyster Creek LRA used line item 3.2.1-10 (E-08) and associated further evaluation section 3.2.2.2.8.1 for steel piping in contact with treated water in the Engineered Safety Features (ESF) Systems.

g. September 2005 Revision 1 SRP Section 3.2.2.2.8.3 addresses line item EP-46. This is a new line item that was not in the January 2005 draft SRP. This MEA combination is not present in ESF systems at Oyster Creek. The Oyster Creek LRA used line items AP-30 (3.3.1-16) and SP-25 (3.4.1-3) for carbon steel piping, piping components, and piping elements exposed to lubricating oil. Reference the Reconciliation document, Attachment 5 Item No. 6 for AP-30 (used in the following systems: Control Rod Drive, Misc. Floor and Eq. Drains, Reactor Recirculation, EDG, Station Blackout, RBCCW, RWCU, Fire Protection, and Service Water), and Attachment 5 Item No. 38 for SP-25 (used in the following systems: Feedwater, Main Generator and Auxiliaries, and Main Turbine and Auxiliaries).

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h. September 2005 Revision 1 SRP Section 3.2.2.2.9 addresses line item E-42 for loss of material in steel piping in a soil environment due to general, pitting, and crevice corrosion. MIC was added to the aging mechanisms in the September 2005 Revision 1 SRP. This item is addressed in the Oyster Creek LRA in the ESF section (E-42, Table 3.2.1-12, LRA Section 3.2.2.2.8.3). The Buried Piping Inspection program B.1.26 addresses aging effects from the MIC aging mechanism. Reference the Reconciliation document, Attachment 5 Item No. 17. The September 2005 Revision 1 GALL now specifies verification that at least one focused or opportunistic inspection in historically or suspected susceptible areas be performed prior to the period of extended operation but within the past 10 years. This is addressed in the Oyster Creek LRA description of the Buried Piping Inspection program B.1.26. Reference the Reconciliation document, Attachment 1, OC Program No. B.1.26.

LRCR #: 272 ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Getz, Stu 2/15/2006

Reviewed By: Miller, Mark 2/17/2006

Approved By: Warfel, Don

NRC Acceptance (Date): 2/17/2006

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Item No		***Date Received:***	***Source***
AMR-341		2/13/2006	AMR Audit
Topic:		***Status:***	Closed
Electrical Compnents			

Document References:
3.6

NRC Representative Mathew, Roy

AmerGen (Took Issue):

Question

AMR line item 3.6.1-4- Component for inaccessible medium-voltage cable is defined as 2KV to 15 KV in LRA. Sept.05 GALL defines as 2KV to 35 KV. Does the LRA reflect this change? What is the commitment number?

Assigned To: Spamer, Deb

Response:

The LRA was submitted prior to the issuance of the September 2005 revision 1 of NUREG-1801. The change in the scope of the inaccessible medium voltage cables was recognized in the reconciliation document prepared for comparison of the Oyster Creek LRA to the September 2005, revision 1 of NUREG-1801. LRCR # 267, as discussed in audit question AMR-325 will revise the LRA, including Table 3.6.1 to reflect the revision to include 34.5 kV cables in both the GALL description and the scope of Oyster Creek's B.1.36 Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements aging management program.

The implementing procedures for this aging management program are being tracked by Passport commitment tracking assignment 330592.36. This assignment includes the scope change for the 34.5 kV circuits within the scope of license renewal. This aging management program Program Basis Document PBD-AMP-B.1.36 includes the scope change for the 34.5 kV circuits within the scope of license renewal. The Table A.05 commitment for this program is commitment number 36.

LRCR #: 267 ***LRA A.5 Commitment #:*** 36

IR#:

Approvals:

Prepared By: Spamer, Deb 2/14/2006

Reviewed By: Micklo, Charles 2/14/2006

NRC Information Request Form

Approved By: Polaski, Fred

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-342

Date Received: 2/13/2006
Source AMR Audit

Status: Closed

Topic:
Electrical components

Document References:
3.6

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

Aging effect/mechanism descriptions for OCGS AMR LRA line items 3.6.1-2. 3.6.1-3, and 3.6.1-8 do not agree with Sept.05 GALL. Does the LRA reflect this change?

Assigned To: Spamer, Deb

Response:

The LRA was written to the January draft of NUREG-1801. A review of line items 3.6.1-2, 3.6.1-3, and 3.6.1-8 from the January draft to the September revision 1 of NUREG-1801 shows a revised aging effect/mechanism discussion for each. The wording in the September revision 1 of NUREG-1801 is in effect a truncation of the earlier discussion. However, the aging effects of "reduced insulation resistance" for all three line items is stated in the earlier NUREG and the LRA. As such, no revision to the LRA is required.

Program basis documents PBD-AMP-B.1.34/35/37 used as the aging management program for line items 3.6.1-2, 3.6.1-3, and 3.6.1-8 respectively manage the reduction insulation resistance by visual inspection and testing. The detection of aging effects for visual inspection list embrittlement, discoloration and cracking consistent with the discussion in the NUREG-1801, rev 1 for programs B.1.34 and B.1.37.

As part of preparing the program basis documents for Oyster Creek, these editorial type changes were identified and determined to be non-impacting with respect to aging management reviews and aging management programs.

Note, NUREG-1832 did not reflect the changed discussion between the revisions of the NUREG-1801.

LRCR #: *LRA A.5 Commitment #:*

IR#:

Approvals:

NRC Information Request Form

Prepared By:	Micklo, Charles	2/14/2006
Reviewed By:	Spamer, Deb	2/15/2006
Approved By:	Polaski, Fred	

NRC Acceptance (Date):

NRC Information Request Form

Item No	*Date Received:*	*Source*
AMR-343	2/13/2006	AMR Audit
	Status:	Accepted by NRC

Topic:
Electrical components

Document References:
3.6

NRC Representative Mathew, Roy

AmerGen (Took Issue): Hufnagel, Joh

Question

AMR line items 3.6.1-9 and 3.6.1-10 identify environment as indoor air(internal) and outdoor air (external) for both carbon and low alloy steel and elastomer. Are they in different locations? Why are the environment different for the same material? Explain.

Assigned To: Spamer, Deb

Response:

Line items 3.6.1-9 and 3.6.1-10 both correspond to the FRCT phase bus enclosure assemblies. The carbon steel enclosures cover the bus bars in the space between the Generator and Generator Accessory Module of each combustion turbine unit. They are located outdoors and the access panels are sealed with elastomer gaskets. (Refer to Aging Management Review Technical Basis document OC-AMR-E-2.5.2, Attachment 4, Summary of Aging Management evaluation and Walkdown Report, photo 3.) Therefore, both materials are subject to an outdoor air external environment and an indoor air internal environment.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Micklo, Charles 2/14/2006

Reviewed By: Spamer, Deb 2/14/2006

Approved By: Polaski, Fred

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-344

Date Received: 2/14/2006

Source AMR Audit

Status: Closed

Topic:
Aging Management of Auxiliary Systems

Document References:
3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

3.3-11
In Table 3.3.2.1.18 of the OCGS LRA, several AMR line items are included for copper or copper alloy components in an auxiliary steam (internal) environment for which loss of material due to pitting or crevice corrosion is managed by one-time inspection alone. Please provide the justification for concluding that one-time inspection alone is sufficient for managing loss of material due to pitting or crevice corrosion for these AMR line items.

Assigned To: Miller, Mark

Response:

This is an error in the application identified in project open item #1554 and PassPort IR 00376714.04.18. The Water Chemistry program, B.1.2, in conjunction with the One-Time Inspection program will manage the loss of material in these components.

LRCR #:

LRA A.5 Commitment #:

IR#: 00376714.04.

Approvals:

Prepared By: Miller, Mark 2/14/2006

Reviewed By: Getz, Stu 2/14/2006

Approved By: Warfel, Don 2/14/2006

NRC Acceptance (Date): 2/14/2006

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Topic:
Aging Management of Auxiliary Systems

Status: Closed

Document References:
3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

3.3-12
In Tables 3.3.2.1.19 and 3.3.2.1.23 of the OCGS LRA, several AMR line items are included for stainless steel components in a condensation environment for which loss of material due to pitting or crevice corrosion is managed by one-time inspection alone. Please provide the justification for concluding that one-time inspection alone is sufficient for managing loss of material due to pitting or crevice corrosion for these AMR line items.

Assigned To: Miller, Mark

Response:

The stainless steel components identified in LRA Tables 3.3.2.1.19 and 3.3.2.1.23 for the Hydrogen & Oxygen Monitoring (H2O2) System and the Nitrogen Supply (N2) System, respectively, subject to condensation (internal) environments are associated with moisture removal portions of the identified systems. In the H2O2 System, moisture is removed from the containment atmosphere, which is inerted with nitrogen, prior to entering the hydrogen and oxygen 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. If the inspection of components in this environment detects material loss (wall thickness < 87.5% of pipe nominal wall thickness), the inspection results will be evaluated by engineering for acceptability. Engineering will determine the rate at which the material is being lost. The results will be evaluated against predetermined limits such as design minimum wall thickness. Unacceptable results will be documented in the corrective action program. An extent of condition review, which is an integral part of the corrective action program, addresses the need to expand the inspection sample population if appropriate.

LRCR #:

LRA A.5 Commitment #:

NRC Information Request Form

IR#:

Approvals:

Prepared By:	Miller, Mark	2/14/2006
Reviewed By:	Muggleston, Kevin	2/14/2006
Approved By:	Warfel, Don	2/14/2006

NRC Acceptance (Date):

NRC Information Request Form

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AMR-346		2/14/2006	AMR Audit
Topic:		*Status:*	Accepted by NRC

Aging Management of Auxiliary Systems

Document References:
3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

3.3-13
In Table 3.3.1 of the OCGS LRA, line item 3.3.1-68 states that the Inspection of Heavy Load and Light Load Handling Systems program (AMP-B.1.16) will be used to manage loss of material in the steel refueling platform; however, the description of AMP B.1.16 does not specifically mention the refueling platform as being in the scope of this program. Please confirm that the refueling platform will be inspected as part of AMP B.1.16, and explain why the structures monitoring program is not being used, as recommended by the GALL Report.

Assigned To: Ouaou, Ahmed

Response:

The refueling platform is in scope of Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems (B.1.16) aging management program. The refueling platform is listed under the scope of Oyster Creek PBD-AMP-B.1.16, page 9. AMR of the refueling platform is listed in LRA Table 3.3.2.1.16. The credited aging management for the component is AMP B.1.16.

The refueling platform is a light load fuel handling hoist that has both passive and active components and travels on rails to perform its design function similar to a crane or hoist. It is considered a mechanical component instead of a structure which is typically stationary. The component is monitored under separate procedures outside the Structures Monitoring Program in the current term. These procedures include both aging management of passive components and testing of active component similar to a crane and hoist. The review of B.1.16 AMP concluded that the program adequately manages aging effects of passive components of the refueling platform. On this basis we credited Inspection of Overhead Heavy and Light Load (Related to Refueling) Handling Systems (B.1.16) for managing aging effects of the platform instead of the Structures Monitoring Program (B.1.31) as recommended by GALL Report.

LRCR #: *LRA A.5 Commitment #:*

IR#:

NRC Information Request Form

Approvals:

Prepared By: Ouaou, Ahmed 2/14/2006

Reviewed By: Micklo, Charles

Approved By: Warfel, Don

NRC Acceptance (Date):

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Item No
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Date Received: 2/14/2006

Source AMR Audit

Topic:
ESF

Status: Accepted by NRC

Document References:

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

In OC-AMR-M-2.3.2.2 for Containment Spray system, the applicant has credited the Periodic Testing of Containment Spray Nozzles AMP (B.2.01) to manage plugging by rust from carbon steel piping components in the containment (drywell and torus) spray system. In accordance with the OCGS AMP B.2.01, the periodic containment spray nozzle flow testing is performed every fifth refueling outage. The AMP also states that the OCGS containment spray nozzles are stainless steel, and there are no carbon steel flow orifices in the system piping. However, the upstream carbon steel piping is subject to general corrosion. From the operating experience, it is noted that during the last test in 2000, two nozzles did indicate no flow due to plugging by rust particles from the carbon steel piping components, indicating that the test frequency may not provide reasonable assurance that these spray nozzles will remain operational to perform their intended function between testing periods. Please provide the technical justification for performing the periodic containment spray nozzle flow testing every fifth refueling outage.

Assigned To: Getz, Stu

Response:

During the last regularly scheduled containment spray nozzle air test performed during outage 18R in 2000, two suppression chamber nozzles indicated some degree of flow blockage. No drywell spray nozzles were found to be blocked. The cause was suspected to be deposition of corrosion particles from carbon steel piping upstream of the nozzles. That corrosion was suspected to be a result of the cyclic wetting and drying of the piping that had occurred when the system was tested monthly using torus water in the past.

In order to schedule a subsequent repair, an analysis was performed regarding the operability of the suppression chamber spray system with the blocked nozzles. The analysis determined that the SAR containment accident analyses are unaffected by suppression chamber nozzle blockage. The analysis assumed that all ten suppression chamber nozzles were blocked, and demonstrated that the plant design basis accidents could be successfully mitigated. GE provided concurrence to the conclusion that the containment accident analysis is not significantly impacted by blockage of the suppression chamber nozzles (Letter, N. Trikouros [GE] to D. Robare [GE], Impact of Operation of

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Oyster Creek with Partial Clogging of Torus Spray Nozzles, NSA00416, DRF T23-00787-00, November 8, 2000). Based on these analyses, repair of the two blocked nozzles was scheduled for the next refueling outage, 19R, in 2002.

In 2002, during refueling outage 19R, the suppression chamber spray header was flushed with water, such as would occur during an actuation of the suppression chamber spray. Subsequent to this, the nozzle air flow test was re-performed, and all nozzles showed clear, meaning that the water spray had dislodged the particles that caused the nozzles to indicate as plugged during the 2000 air test.

The every fifth refueling outage interval for performing the nozzle air test is justified based on the following:

1. Monthly water testing of the piping is no longer performed, removing the source of regular wetting and drying of the carbon steel piping upstream of the nozzles which facilitated corrosion of the piping.

2. Flushing of the system with water, as would occur during an actuation of the suppression chamber spray, discharged and cleared the nozzles that did show as plugged during the air test in 2000.

3. The analyses performed to determine operability of the system with two plugged nozzles showed that SAR containment accident analyses are unaffected by suppression chamber nozzle blockage, even when all ten suppression chamber nozzles were assumed to be blocked, and demonstrated that the plant design basis accidents could be successfully mitigated.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: Getz, Stu 2/16/2006

Reviewed By: Corsi, Lou 2/16/2006

Approved By:

NRC Acceptance (Date): 2/16/2006

NRC Information Request Form

Item No
AMR-348

Date Received: 2/15/2006

Source AMR Audit

Topic:
Reactor Vessel Internals dry tubes

Status: Closed

Document References:

NRC Representative Subudhi, Mano

AmerGen (Took Issue): Hufnagel, Joh

Question

In PBD-AMP-B.1.09, the applicant states that OCGS replaced several cracked dry tubes in 1984. In 1986, the balance of 12 dry tubes was replaced with new ones. When cracked units were found in any subsequent inspections, they were replaced with new ones. OC-ARM-M-2.3.3.39 for Travelling In-Core Probe System refers to Reactor Internals AMR Technical Basis Document for these in-core probes. However, there is no line item for this component in OC-AMR-M-2.3.1.6 for Reactor Internals.

1. Please identify the Table 2 line item for the instrumentation dry tubes. Also, provide inspection results for the last two inspections of these dry tubes and discuss their current conditions.
2. Based on past operating experience, what AMPs are credited to manage their structural integrities during the period of extended operation? Include any augmented inspections that are being performed now or are planned to be performed during the period of extended operation.

Assigned To: May, Mike

Response:

348 – Incore Dry Tubes

LRA Table 3.1.2.1.4 identifies these tubes in line item "Incore Neutron Monitor Dry Tubes, Guide Tubes, & Housings."

1) History – In 1984, cracking was identified on 8 of the 12 original in-core dry tubes. The cracking was found in the non-pressure retaining plunger shaft area and was determined to have been caused by IGSCC as the result of a crevice condition associated with the original dry tube design. In 1984, two of the 12 dry tubes were replaced with a new crevice-free single piece plunger shaft design. The other 6 cracked tubes were technically justified as acceptable for one additional operating cycle. In 1986, the remaining 10 dry tubes were replaced so that all of dry tubes in service have the same crevice-free single piece plunger shaft design.

2) Effectiveness – In 1988, all dry tubes were inspected and no cracking was identified. IRM-17 was

replaced due to a bent tip. In 1991 and 1992, all dry tubes were visually examined with no findings. In 1994, four dry tubes were visually examined with no findings. In 1996, IRM-15 was visually examined with no findings. In 1998, IRM-15 was examined with no findings. In 2000, five dry tubes were visually examined to VT-1 standards. No cracking was identified, but one tip was slightly bent. In 2004, three dry tubes were examined with no findings. These inspection results demonstrate that the replacement design has been effective in preventing cracking due to IGSCC.

3)□Current Program – The inspection plan requires inspections to be conducted on the in-core dry tubes in accordance with the requirements of GE SIL-409, Revision 2 and BWRVIP-47. BWRVIP-47 describes the inspection recommendations for the lower plenum region of the vessel. BWRVIP-47 indicates that inspection of the in-core housing and dry tubes are not required, due to the good field history, significant operating experience, and minimal safety significance. Regardless, at Oyster Creek, the inspections of the in-core dry tubes are performed consistent with the recommendations of GE SIL-409, Revision 2, which recommends replacement after 20 years of service. This is due to the high neutron flux where these components are located, which increases the potential for cracking due to IASCC after long periods of service. Therefore, six of the dry tubes are scheduled for replacement in 2006 and the remaining six are scheduled for replacement in 2008.

4)□Future Program – During the period of extended operation, Oyster Creek will continue to follow the guidance of GE SIL-409, including periodic visual examinations. This, in combination with the replacement of the entire set of dry tubes with new ones of the improved design, provides reasonable assurance that the dry tubes will continue to perform their intended function through the period of extended operation

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: May, Mike

Reviewed By: Getz, Stu

Approved By:

NRC Acceptance (Date):

NRC Information Request Form

Item No
AMR-349

Date Received: 2/15/2006

Source AMR Audit

Topic:
Buried Pipe

Status: Closed

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

GM-5A
As a follow up question to AMR-241, based on review of the Table 2s for Sections 3.1 through 3.4, the Buried Piping Inspection program (AMP B.1.26) is credited to manage loss of material for piping and fittings exposed to soil for the following material/environment combinations. a) Carbon steel/soil (service water system, emergency service water system, etc.), b) cast iron/soil (fire protection system), c) stainless steel/soil (heating and process steam system), d) bronze/soil (roof drains), and e) aluminum/soil (spent fuel pool cooling system, condensate transfer system, etc.). For each of these material/environment combinations, please confirm that at least one inspection has been, or will be performed during the 10-year period immediately prior to entering the license renewal period.

Assigned To: Micklo, Charles

Response:

a) Carbon steel/soil

ECR 05-00344 is scheduled to replace underground carbon steel Service Water piping in 1R21 (2006). During this replacement the Service Water piping will be excavated and inspections of the external coating of the carbon steel Service Water piping will be conducted.

b) Cast iron/soil

Buried cast iron components in the scope of license renewal are valves and fire hydrants in the Fire Protection system. These buried components are coated with coal tar and epoxy coating in the same fashion as the buried carbon steel piping. A buried cast iron fire hydrant was replaced in 2003. The hydrant that was removed was found to have seat degradation and plugged drain holes, but there were no identified indications of external surface or coating degradation.

c) Stainless steel / soil

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The stainless steel piping in the scope of this program is potentially used in the Heating and Process Steam system. This system is in scope for 10 CFR 54.4(a)(2) spatial interaction only. Normally, buried pipe is not in scope for (a)(2) spatial interaction because leakage from a buried portion of pipe cannot spray onto safety related components. However, this "Buried" Heating & Process Steam piping in scope is located in the pipe vault. The pipe vault is primarily an outdoor air environment, but is conservatively considered buried because it can accumulate debris. The Buried Piping Inspection program includes an enhancement to inspect the piping inside this vault in conjunction with the preventative maintenance activity to inspect the vault and pump out accumulated water every 6 months. This activity will be performed within the 10-year period immediately prior to entering the license renewal period. See Section 3.3 of program basis document PBD-AMP-B.1.26, Buried Piping Inspection.

d) Bronze/soil

The buried bronze components in the scope of this program are threaded fittings < 2.5 inches, potentially used in the Roof Drains and Overboard Discharge system. These buried fittings are coated with coal tar and epoxy coating in the same fashion as the buried carbon steel piping. These fittings are associated with an unpressurized drain system whose function is to drain water in the event of a fire protection water system initiation. As such, the pressure boundary integrity is not critical so long as the fitting does not become blocked such that drainage is prevented. These fittings will not be specifically identified for excavation and inspection, as they are adequately addressed by the inspections that have been or will be performed for the buried carbon steel piping external coating inspection.

e) Aluminum/soil

AR A2116126 is scheduled to inspect the coatings on two underground aluminum condensate transfer lines in 2006.

Upon entering the period of extended operation, focused inspection of buried piping and components will be performed within ten years, unless an opportunistic inspection occurs within this ten-year period. The inspections will include at least one carbon steel, one aluminum and one cast iron pipe or component. In addition, for each of these materials, the locations selected for inspection will include at least one location where the pipe or component has not been previously replaced or recoated, if any such locations remain. The stainless steel piping in the vault will continue to be periodically inspected, and the bronze material is addressed by the buried carbon steel pipe coating inspections, as described above.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/16/2006

NRC Information Request Form

Reviewed By: Micklo, Charles 2/16/2006

Approved By: Warfel, Don

NRC Acceptance (Date):

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AMR-350

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Source AMR Audit

Status: Closed

Topic:
Aging Management of Auxiliary Systems

Document References:
3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue):

Question

Question 3.3-14)
In Table 3.3.2.1.17 of the OCGS LRA, several AMR line items are included for carbon steel components in an indoor air (internal) environment for which loss of material due to pitting or crevice corrosion is managed by one-time inspection alone. Please provide the justification for concluding that one-time inspection alone is sufficient for managing loss of material due to pitting or crevice corrosion for these AMR line items.

Assigned To: Miller, Mark

Response:

The carbon steel components identified in LRA Table 3.3.2.1.17 for the Hardened Vent System (HVS) include piping and fittings and a valve body. The Hardened Vent System (HVS) is designed for the mitigation of Severe Accident Sequences that are beyond the Design Basis Accident (DBA). Beyond Design Basis Severe Accident events are not in-scope for License Renewal. However, the HVS pipe and fittings and valve body are an extension of the ventilation stack boundary and are required to maintain their pressure boundary integrity to prevent the backflow of gas effluents and unmonitored releases to the environment. Based on service conditions and environments, significant aging effects on the schedule 40 carbon steel piping and fittings and the 150# class valve body 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. If the inspection of components in this environment detects material loss (wall thickness < 87.5% of pipe nominal wall thickness), the inspection results will be evaluated by engineering for acceptability. Engineering will determine the rate at which the material is being lost. The results will be evaluated against predetermined limits such as design minimum wall thickness. Unacceptable results will be documented in the corrective action program. An extent of condition review, which is an integral part of the corrective action program, addresses the need to expand the inspection sample population if appropriate.

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LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:	Miller, Mark	2/15/2006
Reviewed By:	Muggleston, Kevin	2/15/2006
Approved By:	Warfel, Don	2/16/2006

NRC Acceptance (Date):

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Source AMR Audit

Topic:
FRCTM-1

Status: Closed

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

Based on review of Table 3.6.2.1.2B for the FRCT, the Periodic Inspection Program-FRCT, AMP B.2.5A is credited to manage "cracking initiation and growth" in the combustion turbine mechanical systems. Please describe the inspections that will be conducted to detect "cracking initiation and growth", and provide the technical basis for concluding that the methods employed are adequate.

Assigned To: Muggleston, Kevin

Response:

The inspection procedures to detect cracking initiation and growth will be prepared in accordance with applicable codes, standards and inspection practices. Examination methods include visual examination of disassembled components, surface or volumetric examinations, or other established Non-Destructive Examination (NDE) techniques. The best technique for the component being inspected will be determined based on an evaluation of maintenance and inspection experience with these units and similar General Electric combustion turbine units that have been in service for many years. The manufacturer and power industry users have developed maintenance and inspection plans designed to attain high operational reliability over time. The most appropriate inspection methods will be determined based on this experience and manufacturers recommendations.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/15/2006

Reviewed By:

Approved By: 2/16/2006

NRC Acceptance (Date):

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Item No
AMR-352

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Source AMR Audit

Topic:
FRCTM-2

Status: Closed

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

Based on review of Table 3.6.2.1B for the FRCT, the Bolting Integrity Program-FRCT, AMP B.1.12A is credited to manage "loss of preload" for combustion turbine bolting. Please describe the inspections that will be conducted to detect "loss of preload", and provide the technical basis for concluding that the methods employed are adequate.

Assigned To: Muggleston, Kevin

Response:

The Bolting Integrity - FRCT aging management program is a new program that provides for condition monitoring of bolts and bolted joints within the scope of license renewal at the Forked River Combustion Turbine station. The Forked River Combustion Turbine power plant was originally designed and supplied by General Electric Company. This program is based on the General Electric recommendations for proper bolting material selection, lubrication, preload application, installation and maintenance associated with the combustion turbine units and auxiliary systems. The program also includes periodic walkdown inspections for bolting degradation or bolted joint leakage. Bolted joint inspections rely on detection of visible leakage during routine observations and equipment maintenance activities. These program atributes and bolted joint inspections manage loss of preload aging effects.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/15/2006

Reviewed By:

Approved By: 2/16/2006

NRC Acceptance (Date):

NRC Information Request Form

NRC Information Request Form

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AMR-353		2/15/2006	AMR Audit
Topic:		***Status:***	Closed
FRCTM-3			

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

Based on review of Table 3.6.2.1.2B for the FRCT, there are many combinations of materials and environments for which "NONE/NONE" is indicated for Aging Effect/Aging Program. For each material/environment combination for which NONE/NONE is indicated for Aging Effect/Aging Program, discuss the plant-specific operating experience that supports this AMR determination. If plant-specific operating experience indicates occurrence(s) of degradation for a particular material/environment combination, describe the FRCT plant-specific AMR in detail and identify the aging management activities that will be credited for the extended period of operation.

Assigned To: Muggleston, Kevin

Response:

See AMR Technical Basis Document OC-AMR-M-2.5.1 Station Blackout (SBO) System - Mechanical, including the attached Walkdown Report.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By: Muggleston, Kevin 2/15/2006

Reviewed By:

Approved By: 2/16/2006

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AMR-354

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Source AMR Audit

Topic:
FRCTM-4

Status: Closed

Document References:

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

<u>Question</u>

Based on review of Table 3.6.2.1.2B for the FRCT, the Buried Piping Inspection Program-FRCT (AMP B.1.26A) is credited to manage "loss of material" for piping and fittings exposed to soil. Please confirm that at least one inspection has been, or will be performed during the 10-year period immediately prior to entering the license renewal period for each of the systems for which this AMP is credited. Also, please provide the results of any inspections that have already been completed.

Assigned To: Muggleston, Kevin

<u>Response:</u>

Inspections will be performed during the 10-year period immediately prior to entering the license renewal period for the buried piping for which this AMP is credited. There have not been any inspections completed to date. There have not been and identified failures of this buried piping since the units went into operation.

LRCR #: ***LRA A.5 Commitment #:***

IR#:

<u>Approvals:</u>

Prepared By: Muggleston, Kevin 2/15/2006

Reviewed By:

Approved By: 2/16/2006

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Status: Open

Topic:
Aging Management of Auxiliary Systems

Document References:
3.3

NRC Representative Lofaro, Bob

AmerGen (Took Issue): Hufnagel, Joh

Question

Question 3.3-15
In the OCGS document titled Reconciliation of Program and Line Item Differences Between January 2005 Draft NUREG-1801 and September 2005 NUREG-1801, Section 1 states that It is the OCGS license renewal team's understanding of the NRC's expectation of the scope of reconciliation that new line items added in September 2005 Revision 1NUREG-1801 do not have to be considered in this reconciliation. Please clarify the intent of this statement and how it impacts the reconciliation performed.

Assigned To: Getz, Stu

Response:

LRCR #: ***LRA A.5 Commitment #:***

IR#:

Approvals:

Prepared By:

Reviewed By:

Approved By:

NRC Acceptance (Date):