Nathan Lafferty

From: John Richmond , RI
Sent: Sunday, January 11, 2009 5:52 PM
To: Michael Modes
Cc: Doug Tifft
Subject: OC IR Draft Rev-5
Attachments: OC 2008-07 LRI_rev-5.doc

Importance: High

Michael, here's the latest Rev.

Please review and comment,

ALL comments, criticisms, suggestions, ideas are appreciated

What's Missing
1. URI write up
2. Fatigue monitoring program write up
3. a few fact checks (jer4)
5. List of Docs reviewed (jer4 & Doug)
4. Your (M3) unvarnished review

5/39

Received: from R1CLSTR01.nrc.gov ([148.184.99.7]) by R1MS01.nrc.gov
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Content-Type: application/ms-tnef; name="winmail.dat"
Content-Transfer-Encoding: binary
From: John Richmond <John.Richmond@nrc.gov>
To: Michael Modes <Michael.Modes@nrc.gov>
CC: Doug Tifft <Doug.Tifft@nrc.gov>
Importance: high
Date: Sun, 11 Jan 2009 17:52:00 -0500
Subject: OC IR Draft Rev-5
Thread-Topic: OC IR Draft Rev-5
Thread-Index: Acl0PzbZ9DbaTu6KQ3Svzx5B0PuRkA==
Message-ID: <2856BC46F6A308418F033D973BB0EE72AA60E9B3A8@R1CLSTR01.nrc.gov>
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X-MS-Has-Attach: yes
X-MS-Exchange-Organization-SCL: -1
X-MS-TNEF-Correlator:
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TO BE WITHHELD FOR EXEMPTION 5

Mr. Charles G. Pardee
Chief Nuclear Officer (CNO) and Senior Vice President
Exelon Generation Company, LLC
200 Exelon Way
Kennett Square, PA 19348

SUBJECT: OYSTER CREEK GENERATING STATION - NRC LICENSE RENEWAL FOLLOW-UP INSPECTION REPORT 05000219/2008007

Dear Mr. Pardee

On December 23, 2008, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your Oyster Creek Generating Station. The enclosed report documents the inspection results, which were discussed on December 23, 2008, with Mr. T. Rausch, Site Vice President, Mr. M. Gallagher, Vice President License Renewal, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. In addition, an appeal of a licensing board decision regarding the Oyster Creek application for a renewed license is pending before the Commission. The NRC staff concluded Oyster Creek should not enter the extended period of operation without directly observing continuing license renewal activities at Oyster Creek. Therefore, the NRC staff performed an inspection using Inspection Procedure (IP) 71003 "Post-Approval Site Inspection for License Renewal" and observed Oyster Creek license renewal activities during the last refuel outage prior to entering the period of extended operation.

IP 71003 verifies license conditions added as part of a renewed license, license renewal commitments, selected aging management programs, and license renewal commitments revised after the renewed license was granted, are implemented in accordance with Title 10 of the Code of Federal Regulations (CFR) Part 54, "Requirements for the Renewal of Operating Licenses for Nuclear Power Plants." Because the application for a renewed license remains under Commission review for final decision, and a renewed license has not been approved for Oyster Creek, the standards used to judge the adequacy of selected IP 71003 inspection samples do not apply. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. The enclosed report records the inspector's observations, absent any conclusions of adequacy, pending the final decision of the Commissioners on the appeal of the renewed license.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web-site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

We appreciate your cooperation. Please contact me at (610) 337-5183 if you have any questions regarding this letter.

Sincerely,

Richard Conte, Chief
Engineering Branch 1
Division of Reactor Safety

Docket No. 50-219
License No. DPR-16

Enclosure: Inspection Report No. 05000219/2008007
w/Attachment: Supplemental Information

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web-site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

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Richard Conte, Chief
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Docket No. 50-219
License No. DPR-16

Enclosure: Inspection Report No. 05000219/2008007
w/Attachment: Supplemental Information

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U. S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.:	50-219
License No.:	DPR-16
Report No.:	05000219/2008007
Licensee:	Exelon Generation Company, LLC
Facility:	Oyster Creek Generating Station
Location:	Forked River, New Jersey
Dates:	October 27 to November 7, 2008 (on-site inspection activities) November 13, 15, and 17, 2008 (on-site inspection activities) November 10 to December 23, 2008 (in-office review)
Inspectors:	J. Richmond, Lead M. Modes, Senior Reactor Engineer G. Meyer, Senior Reactor Engineer T. O'Hara, Reactor Inspector J. Heinly, Reactor Engineer J. Kulp, Resident Inspector, Oyster Creek
Approved by:	Richard Conte, Chief Engineering Branch 1 Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000219/2008007; 10/27/2008 - 12/23/2008; Exelon, LLC, Oyster Creek Generating Station; License Renewal Follow-up

The report covers a multi-week inspection of license renewal follow-up items. It was conducted by five region based engineering inspectors and the Oyster Creek resident inspector. The inspection was conducted in accordance with Inspection Procedure 71003 "Post-Approval Site Inspection for License Renewal." Because the application for a renewed license remains under Commission review for final decision, and a renewed license has not been approved for Oyster Creek, [(b)(5)] [(b)(5)] In accordance with the NRC's agreement with the State of New Jersey, state engineers observed portions of the NRC's staff review. The report documents inspection observations, absent any conclusions of adequacy, pending the final decision of the Commissioners on the appeal of the renewed license.

REPORT DETAILS

4. OTHER ACTIVITIES (OA)

4OA2 License Renewal Follow-up (IP 71003)

1. Inspection Sample Selection Process

This inspection was conducted in order to observe AmerGen's continuing license renewal activities during the last refueling outage prior to Oyster Creek (OC) entering the extended period of operation. The inspection team selected a number of inspection samples for review, using the NRC accepted guidance based on their importance in the license renewal application process, as an opportunity to make observations on license renewal activities. Because the application for a renewed license remains under Commission review for final decision, and a renewed license has not been approved for Ovster Creek. [(b)(5) (b)(5)]

Accordingly, the inspectors recorded observations, without any assessment of implementation adequacy or safety significance. Inspection observations were considered, in light of pending 10 CFR 54 license renewal commitments and license conditions, as documented in NUREG-1875, "Safety Evaluation Report (SER) Related to the License Renewal of Oyster Creek Generating Station," as well as programmatic performance under on-going implementation of 10 CFR 50 current licensing basis (CLB) requirements.

The reviewed SER proposed commitments and license conditions were selected based on several attributes including: the risk significance using insights gained from sources such as the NRC's "Significance Determination Process Risk Informed Inspection Notebooks," revision 2; the extent and results of previous license renewal audits and inspections of aging management programs; the extent or complexity of a commitment; and the extent that baseline inspection programs will inspect a system, structure, or component (SSC), or commodity group.

For each commitment and on a sampling basis, the inspectors reviewed supporting documents including completed surveillances, conducted interviews, performed visual inspection of structures and components including those not accessible during power operation, and observed selected activities described below. The inspectors also reviewed selected corrective actions taken as a consequence of previous license renewal inspections.

At the time of the inspection, AmerGen Energy Company, LLC was the licensee for Oyster Creek Generating Station. As of January 8, 2009, the OC license was transferred to Exelon Generating Company, LLC by license amendment No. 271 (ML082750072).

2. NRC Unresolved Item

• An Unresolved Item (URI) will be opened to evaluate whether existing current licensing basis commitments were adequately performed and, if necessary, assess the safety significance for any related performance deficiency.

• The issues for follow-up include the cavity liner strippable coating de-lamination, reactor cavity trough drain monitoring, and sand bed drain monitoring.

• The commitment tracking, implementation, and work control processes will be reviewed, based on corrective actions resulting from AmerGen's review of deficiencies and operating experience, as a Part 50 activity.

10 CFR 50 existing requirements (e.g., current licensing basis (CLB)

The inspectors observed AmerGen's actions to evaluate primary containment structural integrity. The inspectors concluded there were no safety significant conditions with respect to the drywell containment that would prohibit plant startup.

In Bay 11, four small blisters (three of which were initially identified as bumps) on the coating, including a small amount of surface rust under the blisters, were identified and repaired. AmerGen reported that some blistering was expected, and would be identified during routine visual examinations. The NRC staff will review AmerGen's apparent cause evaluation after it is completed.

AmerGen's activities to monitor and mitigate water leakage from the reactor refueling cavity onto the external surface of the drywell shell and into the sand bed regions are still under evaluation.

The drywell shell epoxy coating and the moisture barrier seal, both in the sand bed region, are barrier systems used to protect the drywell shell from corrosion. The problems identified with these barriers had a minimal impact on the drywell steel shell and the projected shell corrosion rate remains very small, as confirmed by NRC staff review of UT data.

Based on a review of the technical information, the NRC staff determined AmerGen has provided an adequate basis to conclude the drywell primary containment will remain operable during the period until the next scheduled examination, in the 2012 refueling outage.

3. Detailed Reviews

3.1 Reactor Refuel Cavity Liner Strippable Coating

a. Scope of Inspection

Proposed SER Appendix-A Item 27, ASME Section XI, Subsection IWE Enhancement (2), stated:

> A strippable coating will be applied to the reactor cavity liner to prevent water intrusion into the gap between the drywell shield wall and the drywell shell during periods when the reactor cavity is flooded. Refueling outages prior to and during the period of extended operation.

The inspector reviewed work order R2098682-06, "Coating application to cavity walls and floors."

b. Observations

From Oct. 29 to Nov. 6, the cavity liner strippable coating limited cavity seal leakage into the cavity trough drain at less than 1 gallon per minute (gpm). On Nov. 6, in one area of the refuel cavity, the liner strippable coating started to de-laminate. Water puddles were subsequently identified in sand bed bays 11, 13, 15, and 17 (see section 3.2 below for additional details). This issue was entered into the corrective action program and initial evaluations identified several likely or contributing causes, including:

- A portable water filtration unit was improperly placed in the reactor cavity, which resulted in flow discharged directly on the strippable coating.
- An oil spill into the cavity may have affected the coating integrity.
- No post installation inspection of the coating had been performed.

3.2 Reactor Refuel Cavity Seal Leakage Trough Drain Monitoring

a. Scope of Inspection

Proposed SER Appendix-A Item 27, ASME Section XI, Subsection IWE Enhancement (3), stated:

> The reactor cavity seal leakage trough drains and the drywell sand bed region drains will be monitored for leakage. Periodically.

Reactor refuel cavity seal leakage is collected in a concrete trough and gravity drains through a 2 inch drain line into a plant drain system funnel. AmerGen monitored the cavity seal leakage daily by monitoring the flow in the trough drain line.

The inspectors independently checked the trough drain flow immediately after the reactor cavity was filled, and several times throughout the outage. The inspectors also reviewed the written monitoring logs.

In addition, the inspectors reviewed AmerGen's cavity trough drain flow monitoring plan and pre-approved Action Plan. AmerGen had established an administrative limit of 12 gpm on the cavity trough drain flow, based on a calculation which indicated that cavity trough drain flow of less than 60 gpm would not result in trough overflow into the gap between the drywell concrete shield wall and the drywell steel shell.

b. Observations

On Oct. 27, the cavity trough drain line was isolated to install a tygon hose to allow drain flow to be monitored. On Oct. 28, the reactor cavity was filled. Drain line flow was monitored frequently during cavity flood-up, and daily thereafter. On Oct. 29, a boroscope examination of the drain line identified that the isolation valve had been left closed. When the drain line isolation valve was opened, about 3 gallons of water drained out, then the drain flow subsided to about an 1/8 inch stream (less than 1 gpm). This issue was entered into the corrective action program.

On Nov. 6, the reactor cavity liner strippable coating started to de-laminate. The cavity trough drain flow took a step change from less than 1 gpm to approximately 4 to 6 gpm. AmerGen increased monitoring of the trough drain to every 2 hours and sand bed poly bottles to every 4 hours. All sand bed bays were originally scheduled to be closed by Nov. 2. However, due to a coating problem, personnel working in sand bed bay 11 identified dripping water on Nov. 8. After the cavity was drained, all sand bed bays were inspected for any water or moisture damage; no deficiencies identified. AmerGen stated follow-up UTs would be performed to evaluate the drywell shell during the next refuel outage. In addition, on Nov. 15, after cavity was drained, water was found in the sand bed bay 11 poly bottle. These issues were entered into the corrective action program.

The inspectors observed that AmerGen's pre-approved action plan was inconsistent with the actual actions taken in response to increased cavity seal leakage. The plan did not direct increased sand bed poly bottle monitoring, and would not have required a sand bed entry or inspection until Nov 15, when water was first found in a poly bottle. The pre-approved action plan directed:

- If the cavity trough drain flow exceeds 5 gpm, then increase monitoring of the cavity drain flow from daily to every 8 hours.
- If the cavity trough drain flow exceeds 12 gpm, then increase monitoring of the sand bed poly bottles from daily to every 4 hours.
- If the cavity trough drain flow exceeds 12 gpm and any water is found in a sand bed poly bottle, then enter and inspect the sand bed bays.

3.3 Drywell Sand Bed Region Drains Monitoring

a. Scope of Inspection

Proposed SER Appendix-A Item 27, ASME Section XI, Subsection IWE Enhancement (3), stated:

> The sand bed region drains will be monitored daily during refueling outages.

There is one drain line for each two sand bed bays (five drains total). A poly bottle was attached via tygon tubing to a funnel hung below each drain line. AmerGen performed the drain line monitoring by checking the poly bottles.

The inspectors independently checked the poly bottles during the outage, and accompanied AmerGen personnel during routine daily checks. The inspectors also reviewed the written monitoring logs.

b. Observations

The sand bed drains were not directly observed and were not visible from the outer area of the torus room, where the poly bottles were located. After the reactor cavity was drained, 2 of the 5 tygon tubes were found disconnected, laying on the floor. In addition, sand bed bay 11 drain poly bottle was empty during each daily check until Nov. 15 (cavity was drained on Nov 12), when it was found full (greater than 4 gallons). Bay 11 was entered within a few hours, visually inspected, and found dry. These issues were entered into the corrective action program.

3.4 Reactor Cavity Trough Drain Inspection for Blockage

a. Scope of Inspection

Proposed SER Appendix-A Item 27, ASME Section XI, Subsection IWE Enhancement (13), stated:

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

The inspector reviewed a video recording record of a boroscope inspection of the cavity trough drain line, performed by work order R2102695.

b. Observations

See observations in section 2.4 below.

3.5 Moisture Barrier Seal Inspection (inside sand bed bays)

a. Scope of Inspection

Proposed SER Appendix-A Item 27, ASME Section XI, Subsection IWE Enhancements (12 & 21), stated:

> Inspect the [moisture barrier] seal at the junction between the sand bed region concrete [sand bed floor] and the embedded drywell shell. During the 2008 refueling outage and every other refueling outage thereafter.

xxx check # of bays inspected

The purpose of the moisture barrier seal is to prevent water from entering a gap below the concrete floor in the sand bed region. AmerGen performed a 100% visual inspection of the seal in the sand bed region (total of 10 bays). The inspectors directly observed as-found conditions of the seal in 5 sand bed bays, and as-left conditions in 3 sand bed bays.

The inspectors reviewed VT inspection records for each sand bed bay, and compared their direct observations to the recorded VT inspection results. The inspectors reviewed Exelon VT inspection procedures, interviewed non-destructive examination (NDE) supervisors and technicians, and observed field collection and recording of VT inspection data. The inspectors also reviewed a sample of NDE technician visual testing qualifications.

The inspectors observed AmerGen's activities to evaluate and repair the moisture barrier seal in sand bed bay 3.

b. Observations

The inspectors observed that NDE visual inspection activities were conducted in accordance with approved procedures. The inspectors verified that AmerGen completed the inspections, identified condition(s) in the moisture barrier seal which required repair, completed the seal repairs in accordance with engineering procedures, and conducted appropriate re-inspection of repaired areas.

The VT inspections identified moisture barrier seal deficiencies in 7 of the 10 sand bed bays, including surface cracks and partial separation of the seal from the steel shell or concrete floor. All deficiencies were entered into the corrective action program and evaluated. AmerGen determined the as-found moisture barrier function was not impaired, because no cracks or separation fully penetrated the seal. All deficiencies were entered into the corrective action program and repaired.

The VT inspection for sand bed bay 3 identified a seal crack and a surface rust stains below the crack. When the seal was excavated, some drywell shell surface corrosion was identified. A laboratory analysis of removed seal material determined the epoxy seal material had not adequately cured, and concluded it was an original 1992 installation issue. The seal crack and surface rust were repaired.

The inspectors compared the 2008 VT results to the 2006 results and noted that in 2006 no seal deficiencies were identified in any sand bed bay.

3.6 Drywell Shell External Coatings Inspection (inside sand bed bays)

a. Scope of Inspection

Proposed SER Appendix-A Item 27, ASME Section XI, Subsection IWE Enhancements (4 & 21), stated:

> Perform visual inspections of the drywell external shell epoxy coating in all 10 sand bed bays. During the 2008 refueling outage and every other refueling outage thereafter.

xxx WHICH bays did Tim go into the 1st week ??
[may have been bays 1 & 11 & 13]
xxx Tim went into bays 5 & 9 & 11 on Nov 13.
xxx jer went into bays 11 & 15, and observed portions of bay 9 & 17

AmerGen performed a 100% visual inspection of the epoxy coating in the sand bed region (total of 10 bays). The inspectors directly observed as-found conditions of the epoxy coating in portions of 7 sand bed bays, and the as-left condition in sand bed bay 11, after coating repairs. The inspectors observed field collection, recording, and reporting of visual inspection data.

The inspectors reviewed VT inspection records for each sand bed bay, and compared their direct observations to the recorded VT inspection results. The inspectors reviewed Exelon VT inspection procedures, interviewed non-destructive examination (NDE) supervisors and technicians, and observed field collection and recording of VT inspection data. The inspectors also reviewed a sample of NDE technician visual testing qualifications.

The inspectors directly observed AmerGen's activities to evaluate and repair the epoxy coating in sand bed bay 11.

b. Observations

The inspectors observed that NDE visual inspection activities were conducted in accordance with approved procedures. The inspectors verified that AmerGen completed the inspections, identified condition(s) in the exterior coating which required repair, completed the coating repairs in accordance with engineering procedures, and conducted appropriate re-inspection of repaired areas.

In bay 11, the NDE inspection identified one small broken blister, about 1/4 inch in diameter, with a 6 inch surface rust stain, dry to the touch, trailing down from the blister. During the initial investigation, three additional smaller surface irregularities (initially described as surface bumps) were identified within a 1 to 2 square inch area near the broken blister. The three additional bumps were subsequently determined to be unbroken blisters. This issue was entered into the corrective action program; all four blisters were evaluated and repaired. On Nov. 13, the inspectors conducted a general visual observation (i.e., not a qualified VT inspection) of the repaired area and the general condition in bay 11. The inspectors verified that AmerGen's inspection data reports appeared to accurately describe the conditions observed by the inspectors.

To confirm the adequacy of the coating inspection, AmerGen re-inspected 4 sand bed bays (bays 3, 7, 15, and 19) with a different NDE technician. No additional deficiencies were identified. A laboratory analysis of removed blister material identified trace amounts of chlorine and concluded the presence of chlorine can result in osmosis of moisture through the epoxy coating. The analysis also concluded there were no pinholes in the blister samples. In addition, the analysis determined approximately 0.003 inches of surface corrosion had occurred directly under the broken blister, and concluded the corrosion had taken place over approximately a 16 year period. UT dynamic scan thickness measurements under the four blisters, from inside the drywell, confirmed the drywell shell had no significant degradation as a result of the corrosion. On Nov. 13, the inspectors conducted a general visual observation (i.e., not a qualified VT inspection) of the general conditions in bay 5 and 9. The inspectors verified that AmerGen's inspection data reports appeared to accurately describe the conditions observed by the inspectors.

In follow-up, AmerGen reviewed a 2006 video of the sand beds, which had been made as a general aid, not as part of an NDE inspection. The 2006 video showed the same 6 inch rust stain in bay 11. The inspectors compared the 2008 VT results to the 2006 results and noted that in 2006 no coating deficiencies were identified in any sand bed bay. This apparent deficiency with the 2006 coating inspection was entered into the corrective action program.

xxx Check CRs >> did bay 4 have any mechanical damage ?

During the final closeout of bays 3, 5, and 7, minor chipping in the epoxy coating was identified, and described as incidental mechanical damage from personnel entry for inspection or repair activities. All deficiencies were entered into the corrective action program and repaired.

During the final closeout of bay 9, an area approximately 8 inches by 8 inches was identified where the color of the epoxy coating appeared different than the surrounding area. Because each of the 3 layers of the epoxy coating is a different color, AmerGen questioned whether the color difference could have been indicative of an original installation deficiency. This issue was entered into the corrective action program, and the identified area was re-coated with epoxy.

3.7 Drywell Floor Trench Inspections

a. Scope of Inspection

Proposed SER Appendix-A Item 27, ASME Section XI, Subsection IWE Enhancements (5, 16, & 20), stated:

> Perform visual test (VT) and ultrasonic test (UT) examinations of the drywell shell inside the drywell floor inspection trenches in bay 5 and bay 17 during the 2008 refueling outage, at the same locations that were examined in 2006. In addition, monitor the trenches for the presence of water during refueling outages.

The inspectors observed non-destructive examination (NDE) activities and reviewed UT examination records. In addition, the inspectors directly observed conditions in the trenches on multiple occasions during the outage. The inspectors compared UT data to licensee established acceptance criteria in Specification IS-318227-004, revision 14, "Functional Requirements for Drywell Containment Vessel Thickness Examinations," and to design analysis values for minimum wall thickness in calculations C-1302-187-E310-041, revision 0, "Statistical Analysis of Drywell Sand Bed Thickness Data 1992, 1994, 1996, and 2006," and C-1302-187-5320-024, revision 2, "Drywell External UT Evaluation in the Sand Bed." In addition, the inspectors reviewed Technical Evaluation (TE) 330592.27.43, "2008 UT Data of the Sand Bed Trenches."

The inspectors reviewed Exelon UT examination procedures, interviewed NDE supervisors and technicians, reviewed a sample of NDE technician UT qualifications. The inspectors also reviewed records of trench inspections performed during two non-refueling plant outages during the last operating cycle.

b. Observations

TE 330592.27.43 determined the UT thickness values satisfied the general uniform minimum wall thickness criteria (e.g., average thickness of an area) and the locally thinned minimum wall thickness criteria (e.g., areas 2 inches or less in diameter), as applicable. For UT data sets, such as 7x7 arrays (i.e., 49 UT readings in a 6 inch by 6 inch grid), the TE calculated statistical parameters and determined the data sets had a normal distribution. The TE also compared the data set values to the corresponding 2006 values and concluded there were no significant differences and no observable on-going corrosion. The inspectors independently verified that the UT thickness values satisfied applicable acceptance criteria.

During two non-refueling plant outages during the last operating cycle, both trenches were inspected for the presence of water and found dry.

During the initial drywell entry on Oct. 25, the inspectors observed that both floor trenches were dry. On subsequent drywell entries for routine inspection activities, the inspectors also observed the trenches to be dry. During the final drywell closeout inspection on Nov. 17, the inspectors observed the following:

- Bay 17 trench was dry and had newly installed sealant on the trench edge where concrete meets shell, and on the floor curb near the trench.

- Bay 5 trench had a few ounces of water in it. The inspector noted that within the last day there had been several system flushes conducted in the immediate area. AmerGen stated the trench would be dried prior to final drywell closeout.

- Bay 5 trench had the lower 6 inches of grout re-installed and had newly installed sealant on the trench edge where concrete meets shell, and on the floor curb near the trench.

3.8 Drywell Shell Thickness Measurements

a. Scope of Inspection

Proposed SER Appendix-A Item 27, ASME Section XI, Subsection IWE Enhancements (1, 9, 14, and 21), stated:

> Perform full scope drywell inspections [in the sand bed region], including UT thickness measurements of the drywell shell, from inside and outside the drywell. During the 2008 refueling outage and every other refueling outage thereafter.

Proposed SER Appendix-A Item 27, ASME Section XI, Subsection IWE Enhancements (7, 10, and 11) stated:

Conduct UT thickness measurements in the upper regions of the drywell shell. Prior to the period of extended operation and two refueling outages later.

The inspectors directly observed non-destructive examination (NDE) activities and the drywell shell conditions both inside the drywell, including the floor trenches, and in the sand bed bays (drywell external shell). The inspectors reviewed UT examination records and compared UT data results to licensee established acceptance criteria in Specification IS-318227-004, revision 14, "Functional Requirements for Drywell Containment Vessel Thickness Examinations," and to design analysis values for minimum wall thickness in calculations C-1302-187-E310-041, revision 0, "Statistical Analysis of Drywell Vessel Sand Bed Thickness Data 1992, 1994, 1996, and 2006," and C-1302-187-5320-024, revision 2, "Drywell External UT Evaluation in the Sand Bed." In addition, the inspectors reviewed the Technical Evaluations (TEs) associated with the UT data, as follows:

- TE 330592.27.42, "2008 Sand Bed UT data - External"
- TE 330592.27.45, "2008 Drywell UT Data at Elevations 23 & 71 foot"
- TE 330592.27.88, "2008 Drywell Sand Bed UT Data - Internal Grids"

The inspectors reviewed UT examination records for the following:

- Sand bed region elevation, inside the drywell
- All 10 sand bed bays, drywell external
- Various drywell elevations between 50 and 87 foot elevations
- Transition weld from bottom to middle spherical plates, inside the drywell
- Transition weld from 2.625 inch plate to 0.640 inch plate (knuckle area), inside the drywell

The inspectors reviewed Exelon UT examination procedures, interviewed NDE supervisors and technicians, and observed field collection and recording of UT data. The inspectors also reviewed a sample of NDE technician UT qualifications.

b. <u>Observations</u>

The inspectors observed that NDE UT examination activities were conducted in accordance with approved procedures.

TEs 330592.27.42, 330592.27.45, and 330592.27.88 determined the UT thickness values satisfied the general uniform minimum wall thickness criteria (e.g., average thickness of an area) and the locally thinned minimum wall thickness criteria (e.g., areas 2 inches or less in diameter), as applicable. For UT data sets, such as 7x7 arrays (i.e., 49 UT readings in a 6 inch by 6 inch grid), the TEs calculated statistical parameters and determined the data sets had a normal distribution. The TEs also compared the data set values to the corresponding 2006 values and concluded there were no significant differences and no observable on-going corrosion. The inspectors independently verified that the UT thickness values satisfied applicable acceptance criteria.

3.9 Moisture Barrier Seal Inspection (inside drywell)

a. Scope of Inspection

Proposed SER Appendix-A Item 27, ASME Section XI, Subsection IWE Enhancement (17), stated:

> Perform visual inspection of the moisture barrier seal between the drywell shell and the concrete floor curb, installed inside the drywell during the October 2006 refueling outage, in accordance with ASME Code.

The inspector reviewed structural inspection reports 187-001 and 187-002, performed by work order R2097321-01 on Nov 1 and Oct 29, respectively. The reports documented visual inspections of the perimeter seal between the concrete floor curb and the drywell steel shell, at the floor elevation 10 foot. In addition, the inspector reviewed selected photographs taken during the inspection

b. Observations

None.

3.10 One Time Inspection Program

a. Scope of Inspection

Proposed SER Appendix-A Item 24, One Time Inspection Program, stated:

> The One-Time Inspection program will provide reasonable assurance that an aging effect is not occurring, or that the aging effect is occurring slowly enough to not affect the component or structure intended function during the period of extended operation, and therefore will not require additional aging management. Perform prior to the period of extended operation.

The inspector reviewed the program's sampling basis and sample plan. Also, the inspector reviewed ultrasonic test results from selected piping sample locations in the main steam, spent fuel pool cooling, domestic water, and demineralized water systems.

b. Observations

None.

3.11 "B" Isolation Condenser Shell Inspection

a. Scope of Inspection

Proposed SER Appendix-A Item 24, One Time Inspection Program Item (2), stated:

> To confirm the effectiveness of the Water Chemistry program to manage the loss of material and crack initiation and growth aging effects. A one-time UT

inspection of the "B" Isolation Condenser shell below the waterline will be conducted looking for pitting corrosion. Perform prior to the period of extended operation.

The inspector observed NDE examinations of the "B" isolation condenser shell performed by work order C2017561-11. The NDE examinations included a visual inspection of the shell interior, UT thickness measurements in two locations that were previously tested in 1996 and 2002, additional UT tests in areas of identified pitting and corrosion, and spark testing of the final interior shell coating. The inspector reviewed the UT data records, and compared the UT data results to the established minimum wall thickness criteria for the isolation condenser shell, and compared the UT data results with previously UT data measurements from 1996 and 2002

b. Observations

None.

3.12 Periodic Inspections

a. Scope of Inspection

Proposed SER Appendix-A Item 41, Periodic Inspection Program, stated:

> Activities consist of a periodic inspection of selected systems and components to verify integrity and confirm the absence of identified aging effects. Perform prior to the period of extended operation.

The inspectors observed the following activities:

- Condensate system pipe expansion joint inspection
- 4160 V Bus 1C switchgear fire barrier penetration inspection

b. Observations

None.

3.13 Circulating Water Intake Tunnel & Expansion Joint Inspection

a. Scope of Inspection

Proposed SER Appendix-A Item 31, Structures Monitoring Program Enhancement (1), stated:

> Buildings, structural components and commodities that are not in scope of maintenance rule but have been determined to be in the scope of license renewal. Perform prior to the period of extended operation.

On Oct. 29, the inspector directly observed the conduct of a structural engineering inspection of the circulating water intake tunnel, including reinforced concrete wall and floor slabs, steel liners, embedded steel pipe sleeves, butterfly isolation valves, and tunnel expansion joints. The inspection was conducted by a qualified structural engineer. After the inspection was completed, the inspector compared his direct observations with the documented visual inspection results.

b. Observations

None.

3.14 Buried Emergency Service Water Pipe Replacement

a. Scope of Inspection

Proposed SER Appendix-A Item 63, Buried Piping, stated:

> Replace the previously un-replaced, buried safety-related emergency service water piping prior to the period of extended operation. Perform prior to the period of extended operation.

The inspectors observed the following activities, performed by work order C2017279:

- Field work to remove old pipe and install new pipe
- Foreign material exclusion (FME) controls
- External protective pipe coating, and controls to ensure the pipe installation activities would not result in damage to the pipe coating

b. Observations

None.

3.15 Electrical Cable Inspection inside Drywell

a. Scope of Inspection

Proposed SER Appendix-A Item 34, Electrical Cables and Connections, stated:

> A representative sample of accessible cables and connections located in adverse localized environments will be visually inspected at least once every 10 years for indications of accelerated insulation aging. Perform prior to the period of extended operation.

The inspector accompanied electrical technicians and an electrical design engineer during a visual inspection of selected electrical cables in the drywell. The inspector observed the pre-job brief which discussed inspection techniques and acceptance criteria. The inspector directly observed the visual inspection, which included cables in raceways, as well as cables and connections inside junction boxes. After the inspection was completed, the inspector compared his direct observations with the documented visual inspection results.

b. Observations

None.

3.16 Drywell Shell Internal Coatings Inspection (inside drywell)

a. Scope of Inspection

Proposed SER Appendix-A Item 33, Protective Coating Monitoring and Maintenance Program, stated:

> The program provides for aging management of Service Level I coatings inside the primary containment, in accordance with ASME Code.

The inspector reviewed a vendor memorandum which summarized inspection findings for a coating inspection of the as-found condition of the ASME Service Level I coating of the drywell shell inner surface. In addition, the inspector reviewed selected photographs taken during the coating inspection and the initial assessment and disposition of identified coating deficiencies. The coating inspector was also interviewed. The coating inspection was conducted on Oct. 30, by a qualified ANSI Level III coating inspector. The final detailed report, with specific elevation notes and photographs, was not available at the time the inspector left the site.

b. Observations

None.

3.17 Inaccessible Medium Voltage Cable Test

a. Scope of Inspection

Proposed SER Appendix-A Item 36, Inaccessible Medium Voltage Cables, stated:

> Cable circuits will be tested using a proven test for detecting deterioration of the insulation system due to wetting, such as power factor or partial discharge. Perform prior to the period of extended operation.

The inspector observed field testing activities for the 4 kV feeder cable from the auxiliary transformer secondary to Bank 4 switchgear and independently reviewed the test results. A Doble and power factor test of the transformer, with the cable connected to the transformer secondary, was performed, in part, to detect deterioration of the cable insulation. The inspector also compared the current test results to previous test results from 2002. In addition, the inspector interviewed plant electrical engineering and maintenance personnel.

b. Observations

None.

3.18 Fatigue Monitoring Program

a. Scope of Inspection

(b)(5)

b. Observations

None.

4. Commitment Management Program

a. Scope of Inspection

The inspectors evaluated Exelon procedures used to manage and revise regulatory commitments to determine whether they were consistent with the requirements of 10 CFR 50.59, NRC Regulatory Issue Summary 2000-17, "Managing Regulatory Commitments," and the guidance in Nuclear Energy Institute (NEI) 99-04, "Guidelines for Managing NRC Commitment Changes." In addition, the inspectors reviewed the procedures to assess whether adequate administrative controls were in-place to ensure commitment revisions or the elimination of commitments altogether would be properly evaluated, approved, and annually reported to the NRC. The inspectors also reviewed AmerGen's current licensing basis commitment tracking program to evaluate its effectiveness. In addition, the following commitment change evaluation packages were reviewed:

- Commitment Change 08-003, OC Bolting Integrity Program
- Commitment Change 08-004, RPV Axial Weld Examination Relief

b. Observations

xxx
xxx

(b)(5)

4OA6 Meetings, Including Exit Meeting

Exit Meeting Summary

xxx (b)(5)

The inspectors presented the results of this inspection to Mr. T. Rausch, Site Vice President, Mr. M. Gallagher, Vice President License Renewal, and other members of

Ex. 5

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AmerGen's staff on December 23, 2008. NRC Exit Notes from the exit meeting are located in ADAMS within package MLxxxx.

No proprietary information is present in this inspection report.

ATTACHMENT

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

C. Albert, Site License Renewal
J. Cavallo, Corrosion Control Consultants & labs, Inc.
M. Gallagher, Vice President License Renewal
C. Hawkins, NDE Level III Technician
J. Hufnagel, Exelon License Renewal
J. Kandasamy, Manager Regulatory Affairs
S. Kim, Structural Engineer
M. McDermott, NDE Supervisor
R. McGee, Site License Renewal
F. Polaski, Exelon License Renewal
R. Pruthi, Electrical Design Engineer
S. Schwartz, System Engineer
P. Tamburro, Site License Renewal Lead
C. Taylor, Regulatory Affairs

NRC Personnel

S. Pindale, Acting Senior Resident Inspector, Oyster Creek
J. Kulp, Resident Inspector, Oyster Creek
L. Regner, License Renewal Project Manager, NRR
D. Pelton, Chief - License Renewal Projects Branch 1
M. Baty, Counsel for NRC Staff
J. Davis, Senior Materials Engineer, NRR

Observers

R. Pinney, New Jersey State Department of Environmental Protection
R. Zak, New Jersey State Department of Environmental Protection
M. Fallin, Constellation License Renewal Manager
R. Leski, Nine Mile Point License Renewal Manager

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened/Closed
None.

Opened

05000219/2008007-01	URI	xxx

Closed
None.

$\cancel{\text{55}}$

LIST OF DOCUMENTS REVIEWED

License Renewal Program Documents
PP-09, Inspection Sample Basis for the One-Time Inspection AMP, Rev 0

Drawings

Plant Procedures and Specifications
LS-AA-104-1002, 50.59 Applicability Review, Rev 3
LS-AA-110, Commitment Change management, Rev 6
645.6.017, Fire Barrier Penetration Surveillance, Rev 13
Specification SP 1302-32-035, Inspection and Minor Repair of Coating on Concrete & Drywell Shell Surfaces in the Sand Bed Region, dated 2/24/93
ER-AA-335-018, Detailed, General, VT-1, VT-1C, VT-3 and VT-3C Visual Examination of ASME Class MC and CC Containment Surfaces and Components, Rev. 5
ER-AA-335-004, Manual Ultrasonic Measurement of Material Thickness and Interfering Conditions, Rev. 2

Incident Reports (IRs)
* = IRs written as a result of the NRC inspection
00804754
00939194
00836395
00838523
00838509
00839848

Maintenance Requests (ARs) & Work Orders (WOs)
WO C20117279
WO R2088180-07
AR00839192
AR00839185
AR00839188
AR00839214
AR00838509
AR00839211
AR00841957
AR00843380
AR00842325
AR00842357
AR00837647

AR00837628
AR00837554
AR00836367
AR00836362
AR00837188
AR00836802
AR00838148
AR00837765
AR00836994
AR00838402
AR00842360
AR00842359
AR00842357
AR00842355
AR00842333
AR00842323
AR00841543
AR00839053
AR00838509
AR00838833
AR00839028
AR00839033
AR00839182
AR00839185
AR00839188
AR00839192
AR00839194
AR00839204
AR00839211
AR00839214

Ultrasonic Test Non-destructive Examination Records
NDE Data Report 2008-007-017
NDE Data Report 2008-007-030
NDE Data Report 2008-007-031
UT Data Sheet 21R056

Visual Test Inspection Non-destructive Examination Records
1R22-LRA-084, Bay 19, 11/8/08
1R22-LRA-083, Bay 15, 11/8/08
1R22-LRA-082, Bay 7, 11/8/08
1R22-LRA-091, Bay 19, 11/8/08
1R22-LRA-026, Bay 1, 10/30/08
1R22-LRA-052, Bay 3, 10/31/08
1R22-LRA-027, Bay 5, 10/29/08
1R22-LRA-054, Bay 7, 10/31/08
1R22-LRA-028, Bay 9, 10/29/08
1R22-LRA-046, Bay 11, 10/31/08

1R22-LRA-035, Bay 13, 10/30/08
1R22-LRA-048, Bay 15, 10/31/08
1R22-LRA-029, Bay 17, 10/30/08
1R22-LRA-050, Bay 19, 10/31/08

NDE Certification Records

NDE Certification #1421 for M. Kent Waddell, dated 10/29/08
NDE Certification #0977 for Richard L. Alger, dated 10/29/08

Miscellaneous Documents

NRC Documents

Industry Documents
* = documents referenced within NUREG-1801 as providing acceptable guidance for specific aging management programs

LIST OF ACRONYMS

ASME	American Society of Mechanical Engineers
EPRI	Electric Power Research Institute
NDE	Non-destructive Examination
NEI	Nuclear Energy Institute
SSC	Systems, Structures, and Components
SDP	Significance Determination Process
TE	Technical Evaluation
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Test
VT	Visual Testing