# Communications Plan and Notification Sequence
# Preliminary Results of Licensee Renewal Commitment Inspection for Oyster Creek Drywell Containment Shell

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**Goal**

To effectively communicate the preliminary results of the NRC staff's inspection of AmerGen's activities to implement license renewal commitments for the Oyster Creek drywell primary containment shell, during the recent refueling outage.

To informing stakeholders of the preliminary notification issued by the staff during the on-going license renewal inspection process.

**Key Messages**

Region I completed the on-site portion of a multi-week inspection of AmerGen's aging management programs associated with the drywell primary containment:

- Containment Metallic Liner Inservice Inspection
- Structures Monitoring Program
- Protective Coating Monitoring and Maintenance Program

NRC staff continue to evaluate AmerGen's actions and assessments regarding water leakage onto the external surface of the drywell shell.

The State of New Jersey State Engineers observed portions of the NRC staff review.

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.

The NRC staff concluded there were no safety significant conditions affecting the drywell shell.

| Time Sequence | ACTION | Responsible Organization/Individual |
|---|---|---|
| T= 0 Hour | Verify AmerGen issues Commission Notification | RI – Tifft / Richmond |
| T= 1 Hour | PN approved by Regional Management and e-mailed to Oyster Creek | RI – Tifft / Richmond |
| T = 1.5 Hour | Call Site VP and Communicate Key Messages | RI – Roberts / Gamberoni |
| T = 2 Hour | E-mail PN and communicate key messages to New Jersey | RI – McLaughlin |
| T = 2 Hour | E-mail PN and communicate key messages to Local Officials, if any, as determined by DRP BC | RI – Bellamy/Alternate |

| | | |
|---|---|---|
| T= 2 Hour | E-mail PN and communicate key messages to NJ Congressional Offices | OCA – Dacus |
| T= 24 Hour + | Respond to Media Inquiries – see developed Q&As attached | RI – Screnci / Sheehan |

**Audience / Stakeholders**

AmerGen (Oyster Creek Nuclear Generating Station)

Senators' DC Offices (Senators Lautenberg & Menendez)

House of Representatives for NJ (Rep. Saxton, Smith, Andrews, Holt, Pallone & Pascrell)

New Jersey Dept. of Environmental Protection

Local officials ?

**Communication Team**

| | | |
|---|---|---|
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**Drywell Shell Background**

In the mid-1980s, GPU Nuclear (previous licensee) identified corrosion of the drywell containment steel shell, in the sand bed region. Initial licensee actions were not effective in arresting the corrosion. In 1992, all sand was removed from the sand bed region and the accessible exterior surfaces of the drywell shell were cleaned and coated with epoxy. Ultrasonic test (UT) thickness measurements of the drywell shell taken in 1992 and 1996 indicated the corrosion had been effectively arrested. This information was confirmed by UT measurements in 2006, during a refueling outage.

**License Renewal Background**

AmerGen submitted a License Renewal Application (LRA) for Oyster Creek on July 22, 2005. The license renewal team inspection occurred in March 2006. Inspection Report 50-219/2006-007 dated September xxx, 2006, documented the inspection results. Among many other areas, the LRA addressed the management of aging effects for primary containment and, including drywell shell corrosion in the sand bed region.

The Atomic Safety and Licensing Board (ASLB) held a hearing on a contention regarding the frequency of planned drywell shell UT inspections. On December xxx, 2007, the ASLB ruled in AmerGen's favor. Citizens (intervener) appealed this decision to the Commission on January 14, 2008. In May 2008, the Commission requested the ASLB to resolve concerns related to planned 3 dimensional (3-D) finite analysis of the drywell shell. The ASLB held oral arguments on September 18, 2008, and responded in a memorandum to the Commission on October xxx, 2008.

Citizens had another appeal to the Commission related to a July 2008 ASLB decision to deny admitting a new contention on metal fatigue and the issue is under Commission review.

**Future Actions**

Region I license renewal outage commitments inspection is on-going. The inspection report number will be 50-219/2008-007.

NRC Commissioners decide on two ASLB appeals related to renewed license - ?

Region I perform non-outage license renewal inspection – planned for March 9 - 27, 2008

The current operating license for Oyster Creek expires on April 9, 2009.

**Anticipated Questions and Answers**

Q1: Why issue this document with only preliminary results of an inspection?

A1: Given the continuing interest in the drywell shell, particularly, in the review of the Oyster Creek license renewal application, and the Atomic Safety and Licensing Board (ASLB) hearing and oral argument on this subject, the timely public disclosure of the results of this inspection was determined to be desirable. Also, on November 6, 2008, AmerGen and NRC staff made Commission and ASLB board notifications related to problems found during the implementation of certain Aging Management Programs.

Q2: When will the inspection results be final?

A2: The inspection results will be final when issued in Inspection Report 50-219/2008-007. A final exit meeting is planned for November 20, 2008, and the report is due out 45 days from that date on or about January 4, 2008. If possible the report may be issued on or about December 21, 2008.

Q3: What prompted the inspection?

A3: This was a scheduled inspection in accordance with the license renewal process under Inspection Procedure 71003. Generally, the inspection addresses the ability for NRC staff to observe license renewal activities which occur during the refueling outage prior to the period of extended operations and which relate to equipment inaccessible (such as the drywell) during reactor operation.

Q4: How do the preliminary evaluation results affect the license renewal process?

A4: They confirm the completion of commitment made by the applicant (licensee) during the course of the application review and as documented in the NRC's staff's safety evaluation report.

Q5: What are the long term next steps following the inspection, and what is done with the findings?

A5: Preliminarily, there were no findings as defined in our inspection process (NRC Inspection Manual Chapter 0612). A number of observations will be documented as a result of this review.

Q6: Why is the reactor safe to operate with these observations?

A6: There were no findings of safety significance. Overall the observations comport the fact the commitments were properly implemented by the licensee.

Q7: What was found and what are the problems?

[ (b)(5) ] 8X75

First in Bay No. 11, on October 31, 2008, the AmerGen reported to the lead inspector that a blister was observed in the epoxy coating in the sand bed region of the drywell in one bay. The blister was very close to the ultrasonic test ("UT") location 11A (which is on the inside of the drywell shell). At the time this was the only blister observed during licensee visual inspection of the coating which appeared to have broken and exhibited a brownish stain. On November 2, 2008, the inspector entered the affected bay and observed the broken blister and three others that were unbroken. AmerGen reported that the broken blister was soft to the touch about one quarter of an inch (1/4") in diameter with an approximately six inch long brown stain which was three and one thirty-seconds (3/32) wide and dry to the touch, trailing down from the blister. AmerGen reported that the three (3) other blister were hard and effort was needed to brake them and remove material. [The blisters are akin to paint blisters on an old house some of which look like bumps or bubbles (unbroken) and those peeling away (broken – the epoxy was not exactly peeling away, this is just an analogy).] The material in and around the blisters were removed on November 5 for laboratory analysis; the brownish stain found near the broken blister and inside the unbroken blister was confirmed to be iron oxide or rust from the drywell under the epoxy coating.

Also, as part of the investigation for the observations, AmerGen reviewed a videotape taken during the 2006 refueling outage that was taken before returning shielding to the access tunnels specifically cut in the concrete containment to provide access to the sand bed region of the drywell shell. The same blister with the brownish stain was visible on this videotape taken in 2006 and it was apparently overlooked during that inspection. The video detail was inconclusive as to whether or not the broken blister grew in two years. There was no evidence of coating degradation reported for inspections in 1994 and 1996.

AmerGen reported that the blistering was expected; they are detectable by VT; the cause, although not specifically known, appeared to be related to molecular interactions through penetration of moisture in the atmosphere through the epoxy coating. More specifically, they are reviewing causes related to pinholes in the coating allowing moisture in the surrounding atmosphere to penetrate the coating and reach the drywell shell or to osmotic blistering resulting from water at the molecular level traveling through the epoxy and interacting with residual chlorine on the drywell shell from pre-1992 wet sand.

Second, on October 31, 2008, during visual inspections of the moisture seal between the drywell shell and the floor of the sand bed region, AmerGen identified a small area of a brownish stain on the moisture seal [four (4) inch crack in the seal]. AmerGen removed the stained section of the moisture seal in order to expose the drywell shell. Only a light coating of corrosion was observed on the seal. AmerGen also identified a number of seal problems during this inspection period in seven of ten bays but this one in Bay 3 had the reddish discoloration near the drywell shell. Behind the seal was apparently "uncured epoxy caulk" which apparently occurred due to improper mixing on initial application. AmerGen reported the uncured caulk would have still been able to function as a moisture barrier. The brownish material was later confirmed to be iron oxide or rust and corrosion on the drywell considered by AmerGen to be light. The area around the seal including the seal and epoxy coating were repaired.

Q8A: What is the safety significance for these problems?

A8A: Although the coating in the area of the blisters was considered by AmerGen to be degraded, it had minimal effect on drywell corrosion based on AmerGen calculations on the oxidation rate and UT measurements. Oxidation under the broken blister was estimated to be at 3.4 mils or 0.22 mils per year. For the unbroken blisters, the corrosion rate was estimated at 0.12 mils per year. They also obtained UT information on the thickness of the drywell near the area of the blisters but on the inside of the drywell. AmerGen reported an average drywell thickness of 750 mils well within the acceptance criteria. The coating is a barrier system designed to protect the drywell, the safety related target for protection from additional substantial corrosion. [A mil is one and one thousandths (1/1000 or .001) of an inch].

All blisters were repaired using compatible epoxy material and the NRC staff had no concerns with the information provided by AmerGen and with the left conditions of the epoxy.

The seals that needed to be enhanced and, in particular, the seal in Bay 3 were considered by AmerGen to be functional. The brownish stains were confirmed to be iron oxide or rust and the corrosion rate on the drywell appeared to be minimal.

All seals and the epoxy coating were enhanced or repaired using compatible epoxy material and the NRC staff had no concerns with the information provided by AmerGen and with the left conditions of the seals.

Q8B: Is there NOT a third problem with the missed observation of a broken blister in 2006 and what is its safety significance?

A8B: AmerGen reported that enhanced preparations and training led to the discovery of these problems. While acknowledging the missed observation of a blister in 2006 [ (b)(5) (b)(5) ] and, as noted above, the corrosion rate under a blister broken (b)(5) or not is considered to have a minimal effect on the drywell in between visual inspections.

Q8C: What does this mean for continued operation?

A8C: The size of the blisters was small and evaluated by AmerGen to be NOT significant even during the last entire last cycle of operation. The degradations on the coating and the potentially degrading seals, however slight, were barrier systems used to protect the drywell, the safety related target for which the barriers exist. The problems identified by the implementation of aging management programs appeared to have had minimal impact on the drywell itself or corrosion rate remained very small.

Even if one were to view the seal problem and degraded coating involving the blisters as not functional, there was no significant amount of water in the sand bed region during operations (the only source is moisture in the atmosphere surrounding the coating and seals) and during refueling even with leakage past the strippable coating in the refueling cavity as noted during this outage (evidence of moisture NOT a flood).

Q9: What does this mean for license renewal?

A9: The problems found were identified by AmerGen through the implementation of several aging management programs which were in place to manage the effects of aging - sand bed region of the drywell shell – this means the programs are effective in identifying important problems before they become more serious.

Commitment 27 in the OCNGS License Renewal Application describes the program for conducting the inspections of the epoxy coating in the sand bed region of the drywell shell. There will be a 100 percent inspection of the coating in the sand bed region every other refueling outage. The NRC staff has concluded in its SER that the programs in place will provide reasonable assurance that any aging effects will be detected before significant damage occurs to the drywell shell in the sand bed region.

Q10: Why was the coating inspected during this outage?

Q10: As stated above, AmerGen committed to do this inspection in the LRA during this outage, which is the last outage prior to entering the period of extended operation.

Q11: When will the coating in the sand bed region of the drywell shell be inspected again?

A11: The next visual inspection of the coating in the sand bed region of the drywell shell is currently scheduled for every other refueling outage or four years. [ AmerGen reports that this frequency will be reviewed and evaluated as a result of observing the blisters during the current inspection. ]

Q12: What has the NRC done in response to these observations?

A12: The NRC Region I staff was on site conducting the license renewal commitment inspection and had been closely following the licensees investigation, including performing an independent inspection of the blister and observation of the removal of the blister. The Region I staff had been in contact with the state of New Jersey and the NRC Headquarters staff. The NRC staff will continue to follow the licensee's investigation.

Q13: When will the results of the chemical analysis of the blister be available?

A13: AmerGen obtained some of the lab analysis by November 10, 2008. The requested lab analysis included chemical results on the brownish stain, thickness measurements of each layer of the epoxy coating (e.g., was the coating too thin), volume calculations of the blister cap to back calculate, based on rust volume, how much steel was lost (e.g., how much thinner did the shell get). See the information above in Q 8 A, B and C.

Q14: Can NRC staff provide some context with regard to the blister, i.e., the blister area is a quarter of an inch but the sand bed region of the drywell liner that was coated with epoxy is xx hundred square feet in size?

A14: In Bay-11, the total area of surface rust (4 separate spots, very near each other) is about 3/4 inch square. Total area of drywell shell steel in sand bed bays is between 600 to 800 feet square. [ (b)(5) (b)(5) ] Ex 5

Details for Answer # 14

The surface area in the sand bed bays (all 10 bays) is roughly between 600 to 800 square feet (see inspector estimate below). There were 4 small rust spots after excavation, each was no larger than about 1/4 inch in diameter. That equates to a total area of about 3/4 of a square inch.

Areas of sand bed epoxy coating are based on inspector observations and inspector arithmetic (these aren't design numbers). The cavity in the sand bed (when you crawl in and try to stand up) is about 5 ft. the epoxy coating does not go all the way up. The bathtub ring is part way up, then the steel plate surface transitions from very rough (due to previous severe corrosion) to flat. Estimating, there is about 4 vertical feet of coating. The NDE inspection instructions say to inspect each bay from 8 foot to the left to 8 foot to the right, from the tunnel entrance. This allows some inspection overlap between the bays. Once inside a bay, you can crawl around to the next bay, and the next bay beyond, but not all the way around (there is some interference in places). So, each bay is a little less than 16 feet long, times 10 bays, times 4 feet in height.

Q15: We understand there was a challenge to keeping water out of the sand bed region. What can you say about that?

A15: On November 7, 2008, AmerGen reported an apparent de-lamination of the strippable coating applied to the liner of the reactor refueling cavity. It was visually evident over the ensuing weekend in that water did overflow the reactor cavity collection trough and enter the sand bed region (evidence of moisture NOT a flood). There was also increased cavity trough drain leakage estimated at 4-5 gallons per minute.

After the reactor cavity is drained there will be a final inspection of the all 10 sand bed regions for any adverse effects. AmerGen confirmed substantial shell thickness margin in the upper regions where some water may have impinged on the drywell surface metal. AmerGen plans to add UT measurements in the same area for the 2010 outage to determine if there is any significant corrosion over time (short exposure to water this outage).

Q16: A) Will the UT data collected during this outage regarding the drywell liner will be used as an input for the 3-D finite element analysis AmerGen must perform prior to entering a period of license renewal. Is that the case? B) And, what are the results of this data taken in 2008?

A16A: During this outage, AmerGen is taking ultrasonic thickness (UT) measurements of the drywell shell in numerous locations, as required by license renewal commitments. Those UT data values will be used as inputs for the 3-D analysis.

A16B: Independently, the NRC inspection staff is reviewing the technical evaluation reports on the UT data but, based on a review of approved UT data sheets, the measurements were within the established acceptance criteria. The NRC staff also confirmed that the acceptance criteria met the current licensing basis – the 3-D analysis is to confirm margins reflected in the current licensing basis; but, at this point, it is not designed to replace it.

The UT measurements were independent of the on-going coating and moisture barrier seal re-work.

Q17: So, what is left to be done on the inspection; why not just exit before startup

A17: As a part of the inspection process, the inspectors were to review the documentation of results as presented by AmerGen. Among documentation for other non-drywell related license renewal commitments, the review is to include a confirmation that:

For Bay 11 Epoxy Coating Problem:

1. AmerGen visual inspections were adequate to detect blisters by observing rust stains.
2. The blistered were repaired
3. Inspections performed every four years remain adequate to detect blisters before significant corrosion occurs.
4. Current visual inspection procedure, including acceptance criteria, is adequate to perform the intended functions as noted above.

For the Bay 3 Moisture Seal Problem:

1. Insignificant amount of material was lost from the drywell shell due to corrosion
2. The moisture barrier and drywell coating in the area were repaired
3. Current visual inspection procedure, including acceptance criteria, is adequate to perform the intended functions as noted above.