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This evaluation is not a Technical Evaluation developed in accordance with CC-AA-309-101. This evaluation simply documents an assessment of Oyster Creek's response to the condition document in IR 00842333 in order to demonstrate that the applicable commitments were met.

Ref. 1: AmerGen Letter to NRC, February 15, 2007, "Additional Commitments Related to the Aging Management Program for the Oyster Creek Drywell Shell, Associated with AmerGen's License Renewal Application (TAC No. MC7624)," Enclosure.

Request

This request is to evaluate the impact of leakage identified during the 1R22 outage, coming into the area of the sand bed region, bays 11, 13 and 15 and 17, on license renewal commitments. This write-up provides the basis for Oyster Creek's position that as outlined below, Oyster Creek has met (or will meet with the actions described below) the license renewal commitments described in IWE Program commitment 3.

Background

On November 6, 2008, at approximately 17:25 hours, it was reported that the Oyster Creek reactor cavity strippable coating, applied prior to filling the reactor cavity with water during 1R22 to minimize leakage through the cavity liner, was becoming delaminated on the West side of the cavity and may therefore facilitate leakage through the liner and into the reactor cavity trough and associated drain line. Leakage into this drain line is monitored daily while the cavity is filled with water, per a license renewal commitment. Ref. 1.

In response to the report of strippable coating delamination, on November 6, 2008, Engineering increased its monitoring of the trough drain from daily to every two hours, and did identify an increase in drain line flow, from less than a gallon per minute, to several (estimated at 4 to 6) gallons per minute.

On November 8, 2008, AmerGen inspectors who were in Bay 11 of the sandbed region heard and then observed water dripping into that area. The sandbed is outside the drywell shell, but inside the concrete shield wall, at approximately the 8' to 12' elevation in the reactor building. In the following days, AmerGen inspectors also observed water dripping into bays 13, 15 and 17.

Commitment related to monitoring for water during a refueling outage

This commitment was made as part of license renewal. Ref. 1. This commitment is commitment 3 of the ASME Section XI, Subsection IWE aging management program:

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"The sand bed region drains will be monitored daily during refueling outages. If leakage is detected, procedures will be in place to determine the source of leakage and investigate and address the impact of leakage on the drywell shell, including verification of the condition of the drywell shell coating and moisture barrier (seal) in the sand bed region and performance of UT examinations of the shell in the upper regions. UTs will also be performed on any areas in the sand bed region where visual inspection indicates the coating is damaged and corrosion has occurred. UT results will be evaluated per the existing program. Any degraded coating or moisture barrier will be repaired. These actions will be completed prior to exiting the associated outage." Ref. 1, Enclosure, page 3 of 13.

Evaluation of our response to this leakage relative to license renewal commitment 3 of IWE Program

For clarity, the commitment is broken down into three parts, with each portion evaluated separately below:

Part 1: "The sand bed region drains will be monitored daily during refueling outages."

Part 2: "If leakage is detected, procedures will be in place to determine the source of leakage and investigate and address the impact of leakage on the drywell shell, including verification of the condition of the drywell shell coating and moisture barrier (seal) in the sand bed region and performance of UT examinations of the shell in the upper regions."

Part 3: "UTs will also be performed on any areas in the sand bed region where visual inspection indicates the coating is damaged and corrosion has occurred. UT results will be evaluated per the existing program. Any degraded coating or moisture barrier will be repaired. These actions will be completed prior to exiting the associated outage."

Part 1

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

Assessment

The sand bed drains have been monitored daily during this refueling outage. Oyster Creek Engineering has written records of their monitoring activities, including a daily log of monitoring activities in PIMS (work order R2095857) and a spreadsheet that was developed to track more frequent monitoring (*i.e.*, every two hours) following cavity coating delamination.

Part 2

"If leakage is detected, procedures will be in place to determine the source of leakage and investigate and address the impact of leakage on the drywell shell, including verification of the condition of the drywell shell coating and moisture barrier (seal) in the sand bed region and performance of UT examinations of the shell in the upper regions."

Assessment

The source of the water in the sandbed region was determined to be the delaminated area of the cavity strippable coating which was observed at approximately 17:25 hours on November 6. This finding is supported by the increase in water volume exiting the cavity drain line (located at elevation 75') after delamination was first identified, and the fact that water was not observed in Bay 11 of the sandbed region (located between approximately elevation 8' and 12') during initial inspections performed many days prior to November 6. AmerGen increased cavity drain line monitoring from daily to every two hours, and began monitoring the sandbed drains in the torus room every four hours. Although not required by the license renewal commitment, AmerGen evaluated underwater reactor cavity strippable coating repair, with a criteria of 25 GPM at the cavity drain line that would trigger consideration of draining the reactor cavity. This plan/procedure is attached below. Also see IR 841543.

On November 7, 2008, AmerGen inspectors who entered Bay 11 in the sandbed region reported water dripping into that area. AmerGen inspectors subsequently identified water in Bays 13, 15 and 17, even though those bays also had been inspected prior to November 6 with no indications of water. Water was first observed in the tubing that drains the sandbed drain from Bay 11(and is collected in a poly bottle) on November 11 at 1400 hours.

As far as addressing the commitment to determine the "impact of leakage on the drywell shell, including verification of the condition of the drywell shell coating and moisture barrier (seal) in the sand bed region and performance of UT examinations of the shell in the upper regions," the current Oyster Creek outage includes full scope visual inspections of the drywell shell coating and moisture barrier (seal) in the sand bed region, and also UT examinations of the drywell shell in both the sandbed and upper regions. Any areas of the drywell shell coating and moisture seal that AmerGen inspectors determined needed repair, were repaired this outage. Moreover, because corrosion is a long-term phenomenon, any corrosion of the uncoated upper regions would not be *observable until UT measurements are taken during subsequent outages.* UT inspections this outage confirmed the drywell shell to be in acceptable condition. However, in addition to these activities (which have been completed as of November 12, 2008), following reactor cavity drain-down, the water will be cleaned up from the sandbed area and the condition of the coating and moisture

barrier will again be re-examined to ensure that the coating and moisture barrier remain in good condition.

The PIMS work order numbers for cleanup of water from Bays 11, 13, 15 and 17 are R2095471, Activity 16, R2105477, Activity 21, R2105479, Activity 23 and R2095467, Activity 22, respectively. The PIMS work orders documenting the final post-drain down inspections are R2095469, R2105515, R2105179, R2095468, R2094623, R2095471, R2105477, R2105479, R2095467 and R2105516.

Also, although UT examinations (1R22-LRA-077 and 021) which were performed in the upper elevations several days after the leakage began, confirmed acceptable thickness of the drywell shell in the upper regions, these UT examinations will be repeated next refueling outage (in 2010) to confirm that the cavity leakage did not cause degradation of the upper drywell shell. These examinations will be at the same locations but will be a one-time addition to the UT examinations of the upper drywell that are being performed every other refueling outage (see commitment 7 of the IWE Inspection Program). Passport assignment 842333.05 has been generated, directing creation of an appropriate work order to be planned for the next refueling outage (1R23), to perform the upper drywell UT exams.

Part 3

"UTs will also be performed on any areas in the sand bed region where visual inspection indicates the coating is damaged and corrosion has occurred. UT results will be evaluated per the existing program. Any degraded coating or moisture barrier will be repaired. These actions will be completed prior to exiting the associated outage."

Assessment

As noted above, an additional visual inspection of the coating and moisture barrier in the sand bed area will be performed following drain down of the reactor cavity and clean up of the water, to confirm there is no coating damage and that no associated corrosion could occur. If degradation is identified during those inspections, then corrective actions as specified in the commitment will be taken prior to exiting the 1R22 outage. Future visual and UT inspections of the sand bed area, per the existing program, will confirm that no shell degradation will have occurred as the result of this recent water leakage into the sand bed area during 1R22.

Preparer - Pete Tamburro

Attachment 1

Reactor Cavity Coating Delamination Investigation

The cavity coating was found to be disengaged from cavity wall along the West side at approximately 1725 hours on November 6, 2008.

An in-vessel inspection completed at approximately 1830 hours, no coating materials observed in the vessel.

Met with Master Lee, Engineering and Rx services at approximately 1830 hours, coating can not be re-adhered to the cavity wall, repair/re-application would require drain down of cavity. Bob Burns of ML stated the un-adhered cavity coating material should remain intact and not create an FME issue. Requested Burns check with industry/peers for possible underwater repair options.
(Burns reports back at approximately 2100 hrs no underwater repair options available.)

Drain at V-18-131 on Rx 75' engineering reports increase in drainage as of 2000 hours. Current leak rate is approx. 4-5 gpm, was 1-2 gpm. Drainage can be improved via additional drain-line from V-18-133 if needed.

Visual inspection of cavity coating completed at approximately 2030 hours finds the effected area is approximately 20' in length from top to bottom of the coating, with an additional 4 - 6' in length disengaged along the bottom at each end of the effected area.

Visual inspection of sand bed poly bottles in the Torus room found no water as of 2100 hours.

Additional actions:

1. Williams Coating will be entering sand bed bay 11 this shift and requested to perform a visual inspection of the area for water. –Andy Kirsch, Williams Coating (completed 0630 on 11/7, no water observed)

2. Rx services to secure edges of coating - Eric Tschrante, complete.

3. Engineering to approve utilization of V-18-133 to improve drainage, no temp mod needed for installation of drain hose. (Complete 0015 hours)

4. Request for drain hose installation from V-18-133 given to Ops WEC at 0100 hours, hose installation will be completed this shift and controlled via EST. (Not installed as of 0450 hrs, all parts needed are staged and drain from V-18-133 will be added to V-18-131 temp. mod. Installation may not be completed prior to end of shift per WEC at 0550 hours.) Parts are staged and ready if needed, per Ops (Rumbin) not needed at this time.

On going actions:

1. Rx services to monitor coating for further degradation every 4 hours - Eric Tschrante

2. Engineering to monitor drain-line every 2 hours and report results to McMillan/Barnes – Mike Ruszkowski

3. Engineering to monitor sand bed drains in Torus room every 4 hours and report results to McMillan/Barnes – Mike Ruszkowski

4. Engineering to monitor RBEDT pump run time every 2 hours and report results to McMillan/Barnes – Mike Ruszkowski

Additional information:

1. Cavity drain down currently scheduled 11/10 at 0500 hrs. (The cavity was actually drain on 11/12/08.)

2. To drain down to repair the coating is approx. 28 hours to complete drain down, if the station can process water. An additional 26 hours to repair coating and re-flood cavity, total duration 54 hours.

Contacts:
Coating Refuel floor coordinator x 4419
Eng. Mike Ruszkowski x 4995, nights
Eng. Reuben Martinez x 4525, days
Aaron Briggs Eng-4928
WEC x2404
ECC-4445

Underwater Coatings Contacts

Exelon-Gary Alkire-Cantera-630-657-3830

Diver/Coating Contractor Contacted

Charlie Vallance
Office-321-779-9693
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Cavity Coating Decision to be made

Can we apply an underwater strippable coating to stop the leak?

No. There is no underwater coating that is strippable in nature that could be applied to the cavity liner and then removed following drain down. Underwater epoxy materials can be used but would be difficult to remove following drain down and there is no guarantee that all the epoxy could be removed from the cavity line. Per the vendor, this material most likely would not be suitable for use in a reactor cavity.

At what point would we consider drain down and perform a repair of the cavity coating?

Leakage from the liner >25 gpm at 75' drain hub

Time for Master Lee to perform the cavity coating repairs is approx 3 hours from the time drain down and covering of the reactor is complete.