Oyster Creek
License Renewal Commitments Inspection
Exit Meeting - Dec 23, 2008 at 9 am

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Introductions
- NRC Region 1
- NRC HQ
- NRC Residents
- AmerGen
- NJ DEP (Observers)

Excellent Overall Cooperation
from everybody
>>> use of the Certrec Internet Database was quite helpful

Special Thanks
- Pete Tamburro (LR Program Owner)
- Chris Hawkins (NDE Level-III)
- Cal Taylor & Jhansi Kandasamy

Inspection Schedule Slippage
- LR outage schedule slipped due to unexpected issues
  - Some NDE UTs re-scheduled, due to unanticipated physical interference issues
  - Bay 11 Coating Blisters
  - Bay 3 Moisture Barrier Seal Problem
  - Cavity Leakage and Water Intrusion into 4 bays
- As a result, our inspection ran into a 2nd on-site week and a 3rd in-office week

Documentation
Team Report 45 days after the Exit Meeting (early Feb)

Review of Regulatory Framework
[Darrell Roberts]

Existing Part 50 -- Current Licensing Basis
Pending Part 54 Decision on License Renewal and License Obligations

Exec Summary of Inspection Results

- Observed actions to evaluate primary containment structural integrity
- Observed selected activities described in SER Appendix-A, "Commitments for LR"

- Because the application for a Renewed License remains under Commission review for final decision -- With respect to proposed SER commitments:
    - No assessment of implementation or effectiveness will be documented
    - Factual Based Observations of activities will be documented

- Inspection observations were considered, in light of:
    - Part 50 existing requirements (e.g., CLB)
    - Pending Part 54 commitments
    - Programmatic performance under on-going implementation of Part 50 requirements

- The conclusions of PNO-1-08-012 remain unchanged

- Reviewed 2 change packages for proposed activities described in SER App-A
    - A summary of the change will be documented
    - The Exelon commitment management program is an existing CLB program. The implementation of this existing program provided adequate administrative controls.

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 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.

Key Inspection Observations

Six Key observations will be Documented

For the Six Key Observations:

- Regarding AmerGen's activities to perform proposed LR commitments, the NRC will review AmerGen's operating experience review and corrective actions, as appropriate, as part of the scheduled March 2009 IP 71003 Inspection.

(1) 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.
[Proposed SER App-A Item 27, ASME Section XI, Subsection IWE, Part (2)]

Strippable Coating De-lamination

- From Oct 29 to Nov 6, the strippable coating limited leakage into the cavity trough drain at < 1 gpm
- On Nov 6, the observed leakage rate in the cavity trough drain took a step change to 4 to 6 gpm
- Water puddles were subsequently identified in 4 sand bed bays
- AmerGen identified several likely or contributing causes
    - 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
- AmerGen stated follow-up UTs will re-evaluate the drywell shell next outage

(2) Reactor cavity seal leakage trough drains and the drywell sand bed region drains will be monitored for leakage. Periodically.
[Proposed SER App-A Item 27, ASME Section XI, Subsection IWE, Part (3)]

Cavity Trough Drain Line Found Isolated

- On Oct 27, the 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 identified the drain line 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 (< 1 gpm)

Drain Flow Monitoring Plan

- AmerGen stated a calculation determined cavity trough drain flow of less than 60 gpm would not result in trough overflow into the gap between the drywell shield wall and the drywell shell
- AmerGen had a pre-approved Action Plan for monitoring cavity & sand bed drains
- Per the Action Plan --
    - If drain flow > 5 gpm, then monitor every 8 hours
    - If drain flow > 12 gpm, then monitor sand bed poly bottles every 4 hours
    - If drain flow > 12 gpm <u>and</u> water found in sand bed poly bottles, then enter & inspect sand beds

Water Found in Sand Bed Bays

- On Nov 6, the strippable coating started to de-laminate
- Trough drain flow took a step change from < 1 gpm to approx 4 to 6 gpm
- Increased monitoring of trough drain to 2-hr and sand bed poly bottles to 4-hr (not req'd by Action Plan)
- On Nov 8, workers inside sand bed bay 11 identified dripping water
- Subsequently, water puddles were identified in 4 sand bed bays
- After cavity was drained, inspected all sand bed bays -- No deficiencies identified
- Sand bed bays were originally scheduled to have been closed by Nov 2
- On Nov 15, after cavity was drained, water was found in sand bed bay 11 poly bottle

(3) Sand bed region drains will be monitored daily during refueling outages.
[Proposed SER App-A Item 27, ASME Section XI, Subsection IWE, Part (3)]

Sand Bed Drain Poly Bottles Not Connected

- Sand bed drains were remotely monitored by checking poly bottles, attached via tygon tubing to funnels hanging below the drain lines
- The drains were not directly observed
- After the reactor cavity was drained, 2 of the 5 tygon tubes were found disconnected, laying on the floor
- 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 (> 4 gallons). Bay 11 was entered, visually inspected, and found dry.

(4) Perform visual inspections of epoxy coating on the drywell external surfaces in the sand bed bays. [Proposed SER App-A Item 27, ASME Section XI, Subsection IWE, Part (4)]

- Directly observed conditions of the drywell shell epoxy coating in selected sand bed bays
- NRC reviewed VT-1 examination records for each sand bed bay, and directly inspected 7 bays
- Observed AmerGen's activities to evaluate the epoxy coating

Sand Bed Bay 11 Blisters

- Observed activities to evaluate and repair blisters found in Bay 11
    - 1 small 1/4 inch broken blister identified, with a 6" rust stain
    - 3 smaller unbroken blisters were identified by the NRC, during initial investigation
    - All 4 blisters were within a 1-2 inches square area, and all were evaluated and fixed
- For extent of condition, 4 bays re-inspected by different NDE level-II
    - -- AmerGen reported that No deficiencies were identified ??
- AmerGen estimated corrosion of ~ 3 mils had occurred over about a 16 year period

Sand Bed Bay 9 Coating Deficiency

- AmerGen identified and fixed a area approximately 8" x 8" that appeared to NOT have had all 3 layers of the epoxy coating applied.

2006 Inspection Did Not Identify the Bay 11 Rust Stain or the Bay 9 Coating Deficiency

- AmerGen reviewed a 2006 video and identified the same 6" rust stain in the 2006 video of Bay 11
- CR 844815 stated the Bay 9 coating deficiency was most probably an original 1992 installation issue
- During the 2006 coatings inspection, these 2 deficiencies were not identified

(5) The external drywell shell moisture barrier seal, between the shell and the sand bed floor, will be inspected when the epoxy coating is inspected.
[Proposed SER App-A Item 27, ASME Section XI, Subsection IWE, Part (12)]

- Directly observed conditions of the drywell shell moisture barrier in selected sand bed bays
- NRC reviewed VT-1 examination records for each sand bed bay, and directly inspected 7 bays
- Observed AmerGen's activities to evaluate the moisture barrier
- AmerGen identified deficiencies in 7 of the 10 sand bed bays, including
    - Surface cracks
    - Partial separation of the seal from the shell, or the floor
- AmerGen determined the moisture barrier function was not impaired, because no cracks or separation fully penetrated the seal. All deficiencies were repaired.

Sand Bed Bay 3 Seal Crack and Rust Stain
- Observed activities to evaluate and repair the moisture barrier seal in Bay 3
- The seal had rust stains on the surface, below the identified crack
- When the seal was excavated, some drywell shell surface corrosion was identified
- Seal crack and surface rust were repaired
- Laboratory analysis determined there was inadequate epoxy cure, an original 1992 installation issue

2006 Inspection Did Not Identify Any Seal Cracks
- During 2006 seal inspections, no deficiencies were identified

(6) Drywell In-service Inspection - Ultrasonic Thickness Measurements
[Proposed SER App-A Item 27, ASME Section XI, Subsection IWE]

- Observed AmerGen perform drywell shell UT thickness measurements
- Observed AmerGen evaluate the UT data (2000 separate UT readings)
- NRC reviewed all UT examination records and AmerGen's Technical Evaluations of the UT data
- AmerGen determined that all of the UT data satisfied acceptance criteria, based on current licensing basis design requirements, for the thickness of the steel plate
- AmerGen did not identify any significant conditions affecting the drywell shell structural integrity
- AmerGen did not identify any on-going corrosion or corrosion trend, based on the UT examinations
- AmerGen did not identify any statistically significant deviations from 2006 UT data values

As a Reminder -- For these Six Key Observations

- Regarding AmerGen's activities to perform proposed LR commitments, the NRC will review AmerGen's operating experience review and corrective actions, as appropriate, as part of the scheduled March 2009 IP 71003 Inspection.

No Noteworthy Observations

Protective Coating Monitoring and Maintenance Program
- D/W Interior Service Level I Coating

Electrical Cables and Connections
- Drywell Cable Inspections

Inaccessible Medium Voltage Cables
- Cable Test - as part of the Doble Test on Auxiliary Transformer (bank 4)

Buried Piping
- ESW Pipe Replacement and Tie-in

Structures Monitoring Program
- Intake tunnel and expansion joints

One-Time Inspection Program
- Isolation Condenser Inspection and UT below the water line

Periodic Inspection Program
- Condensate System expansion joint inspection
- Fire barrier inspection inside a switchgear

Metal Fatigue Program
- No changes to the high cumulative usage factor components list

Looking Forward -- Next Steps -- Closing Comments

[Rich Conte]

ANY QUESTIONS for US