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July 21, 2010

Mr. J. R. Morris
Site Vice President
Catawba Nuclear Station
Duke Energy Carolinas, LLC
4800 Concord Road
York, SC 29745

SUBJECT: CATAWBA NUCLEAR STATION, UNIT 2 (CATAWBA 2) - SUMMARY OF TELEPHONE CONFERENCE CALL REGARDING THE FALL 2007 STEAM GENERATOR (SG) TUBE INSPECTIONS

Dear Mr. Morris:

On October 4, 2007, U.S. Nuclear Regulatory Commission (NRC) staff participated in a conference call with representatives of Duke Energy Carolinas, LLC (the licensee), regarding its ongoing SG tube inspection activities at Catawba 2.

Enclosed is a summary of the conference call. The NRC staff did not identify any issues that would warrant immediate follow-up action.

If you have any questions, please contact me at (301) 415-1119 or send an e-mail to Jon.Thompson@nrc.gov.

Sincerely,

Jon Thompson

Jon Thompson, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-414

Enclosure:
Conference Call Summary

cc w/encl: Distribution via ListServ

SUMMARY OF OCTOBER 4, 2007, CONFERENCE CALL WITH

DUKE ENERGY CAROLINAS, LLC REGARDING THE 2007

STEAM GENERATOR TUBE INSPECTION RESULTS

CATAWBA NUCLEAR STATION, UNIT 2

DOCKET NO. 50-414

On October 4, 2007, the U.S. Nuclear Regulatory Commission (NRC) staff participated in a conference call with representatives of Duke Energy Carolinas, LLC (the licensee), regarding its fall 2007 ongoing steam generator (SG) tube inspection activities at Catawba Nuclear Station, Unit 2 (Catawba 2). The inspection activities were conducted during the end-of-cycle 15 refueling outage. To facilitate this conference call, the licensee provided supplemental material which is included as an attachment to this enclosure. At the time of the call, SG tube inspections were still in progress.

Catawba 2 has four Westinghouse Electric Company Model D5 SGs, 2A through 2D, which were placed in service in 1986. Each SG has 4,570 thermally treated Alloy 600 tubes with an outside diameter of 0.75 inches and a nominal wall thickness of 0.043 inches. The tubes are hydraulically expanded for the full depth of the tubesheet at each end. The tubes are supported by Type 405 stainless steel support plates with quatrefoil-shaped holes. The U-bend region of the tubes installed in Rows 1 through 9 was thermally treated after bending in order to reduce stress.

During the October 4, 2007, conference call, the licensee provided additional clarifying information, or information not included in the attached material, which is summarized below:

- An axial crack-like indication was detected in the tube located in row 15, column 79 in SG B. The indication was located slightly above the top of the tubesheet on the hot-leg side. The indication was not associated with the expansion transition, but was located within the sludge pile region. The length of the indication was 0.27 inches. All three probes used to inspect the indication (array, +Point™, and Ghent) yielded comparable length estimates. This location was last inspected during the end-of-cycle 14 outage in 2006. During the 2006 outage, there was no evidence of a crack-like indication at this location, but there were indications of deposits at this location.

- A second axial crack-like indication in the tube located in row 26, column 64 in SG B is similar in size to the indication in row 15, column 79. The licensee thought the tube in row 26, column 64 had been inspected during the last SG inspection outage (however, they had not verified this at the time of this call).

- Both of the axial crack-like indications were located slightly above the secondary face of the hot-leg tubesheet and were detected with the array probe. Both of the indications were above the expansion transition.

- The sludge pile height is 2 inches above the top of the tubesheet. Although the inspection scope at the top of the tubesheet only requires inspecting to 3 inches above the top of the tubesheet, usually data is acquired up to 4 inches above the top of the tubesheet.

- With respect to indications of wear at the anti-vibration bars, the maximum depth observed was 35-percent through-wall. The growth rate for the indications of wear at the anti-vibration bars was consistent with past inspections.

The NRC staff did not identify any issues that warranted immediate follow-up action during the conference call.

Catawba Unit 2
Stream Generators
EOC 15
NRC Conference Call
October 4, 2007

Purpose

Notify NRC of observation of ODSCC [outside diameter stress corrosion cracking] like indications in B steam generator [SG].

Background Information

- Original Westinghouse [Westinghouse Electric Company] Model D-5 Steam Generators with Alloy 600 TT [thermally treated] tubing
- Base scope inspection being performed with the x probe
- Previous history of ID [inside diameter] crack like indications at high stress locations (tack expansions, etc)

Indication Information

SG	Tube	Location (in)	Depth %	Length (in)	Surface	Orientation	In situ
B	15-79[1]	TSH[3] +0.18	23	0.27	OD[4]	Axial	N
B	26-64[2]	TSH+0.57					

1=plus point data
2=array data
[3 – TSH = tubesheet hot]
[4 – OD = Outer Diameter]

- The indication in tube 15 -79 was confirmed by the array, plus point and Ghent data.
- The inspection sample in B SG has been expanded from 20 % to 100 % expansion transitions of the hot leg tubesheet.
  - There was already a 20 % inspection sample in all other steam generators.
- Other active degradation
  - AVB [anti-vibration bar] wear – looks normal
  - Tube end PWSCC [primary water stress corrosion cracking] - new indications, growth of previous indications

Current Status

Steam Generator	A	B	C	D
% complete	74	55	72	52
Expected Finish Day	Sunday 10/7	Tuesday 10/9	Sunday 10/7	Sunday 10/7

Scope

Baseline inspection scope shall include full length data acquisition and bobbin coil data analysis on all four (4) steam generators as follows. ECT [eddy current testing], data from all active coils shall be recorded full length.

1) All tubes with previous indications, e.g., wear, DNT [dent], PLP [possible loose part], etc. (above ARC [alternate repair criteria] elevation)
2) All tubes surrounding plugged tubes one tube deep.
3) Periphery tubes two rows deep (outer perimeter, open lane, and T-slot)
4) 20% sample of Row 1 through Row 10
5) Tubes susceptible to "Seabrook type" ODSCC due to cold work (approx. 27 tubes)
6) 25% random sample of remaining tubes not inspected during EOC [end-of-cycle] 14

Special interest inspection scope shall include data acquisition and array data analysis as follows:

1) Special interest based on new bobbin calls (new wear indications, all bobbin "I" codes, and some miscellaneous codes)
2) 20% sample of tubesheet region in all four (4) steam generators from TEH [tube-end hot] to TSH [tubesheet cold] +3 inches
3) 20% sample of Row 1 and 2 u-bend regions in all four (4) steam generators
4) 20% sample of Row 10 u-bend regions in all four (4) steam generators
5) 20% sample of Rows 1 through 10 at tube supports 08H and 09C in all four (4) steam generators (for evidence of complete blockage)
6) 20% sample of pre-heater expansions in all four (4) steam generators
7) Periphery tubes two rows deep (TSH to TSH + 3", TSC to TSC + 3") in all four (4) steam generators (Outer perimeter, open lane, and T-slot)
8) Periphery tubes at 18th tube support plate on cold leg (two rows deep) in all four (4) steam generators
9) 100% of Tubesheet OXP's [overexpansions] and bulges in Steam generator "B" hot leg (above ARC elevation)
10) 20% of tubesheet OXP's and bulges in all remaining channel heads (above ARC elevation)
11) New dent indications and existing dent indications not analyzed during EOC14
12) Bounding inspections two tubes around all PLP indications confirmed with array
13) Bounding inspections two tubes around all PLP indications dating back to EOC 11 if indications are still present/confirmed with array.

Plug inspection scope shall be as follows:

1) Visual inspection of all plugs

Plant Information

The end of cycle 15 was 1.36 EFPY [effective full power years]. The total EFPY is 17.43.

Plant Information	Unit 2
Commercial Operation	8/86
Current Operating Cycle	15
Steam Generator Manufacturer	Westinghouse
Steam Generator Model	D5
Number of Steam Generators	4
S/G Tube Material	I-600 TT
S/G Support Plate Material	405 SS [stainless steel]
S/G Support Plate Design	Quadrefoil Broached
Number of S/G Support Plates	19
SG tubesheet Nominal	21" thick with 0.20" Alloy 600 cladding
S/G Tubesheet Expansion	Hydraulic Expansion
S/G Peening (Hot or Cold Leg)	No
U-bend stress relief	Row 1-9 by manufacturer
Thot	615□F
Tcold	556□F
# Tubes in RSG	4570 + 8 tubesheet hole plug assemblies.
Nominal Wall Thickness	0.043
Plugging Limit	10%
Turbine Manufacturer	General Electric
Secondary System Construction	All Ferrous
Feedwater Heater Tube Material	304 SS
Condenser Tube Material	316 SS
MSR Tube Material	439 SS
Condensate Polishers	Filter/Demins
Condenser Cooling Water	Cooling Towers
Makeup Water System	Filtration/RO [reverse osmosis]/Demins
Secondary Chemistry Program	3-MPA/DMA/Hydrazine

NRC Generic Questions

1. Discuss any trends in the amount of primary-to-secondary leakage observed during the recently completed operating cycle.

   There has been no primary-to-secondary leakage during the recently completed operating cycle.

2. Discuss whether any secondary side pressure tests were performed during the outage and the associated results.

   No secondary side pressure tests have been performed. None are planned.

3. Discuss any exceptions taken to the industry guidelines.

No exceptions have been taken to the EPRI [Electric Power Research Institute] and PWR [pressurized-water reactor] Steam Generator Examination Guidelines.

4. For each steam generator, provide a description of the inspections performed including the areas examined, the probes used, and the expansion criteria. Also, discuss the extent of rotating probe inspections performed in the portion of the tube below the expansion transition region.

   See above

5. For each area examined, provide a summary of the number of indications found to date for each degradation mode. For the most significant indications in each area, provide an estimate of the severity of the indication. In particular, address whether tube integrity was maintained during the previous operating cycle. In addition, discuss whether any location exhibited a degradation mode that had not previously been observed at this location in this unit.

   See above

6. Describe repair/plugging plans.

   Two tubes to date

7. Describe in-situ pressure test and tube pull plans and results.

   No in-situ pressure testing or tube pulls are planned.

8. Provide the schedule for steam generator related activities during the remainder of the current outage.

   See above

9. Discuss the following regarding loose parts: What inspections are performed to detect loose parts, a description of loose parts identified and their location within the steam generator, if loose parts were removed, tube damage associated with loose parts, and the source or nature of the loose parts.

   Secondary side visual inspections have been completed for all 4 steam generators. These inspections included a post sludge lance top of tubesheet tube free lane, annulus, and selected in-bundle columns to verify effectiveness of the sludge lance. Additionally, confirmation that the 14 support blocks (Item 13) welded to the wrapper and underneath Plate A (01H and 19C) were intact. No anomalies were identified.

   Top of pre-heater baffle plate (18C) visual inspections were performed on all Steam Generators. This was a follow up inspection to those performed during EOC13 and EOC14 outages. The foreign material identified is consistent with that discovered in the

previous outages with those objects removed that have high likelihood to damage the tubing. All objects that could not be retrieved are evaluated as acceptable for one cycle of operation.

An inspection was performed in one steam generator for the top tube support to characterize the tube deposit loading and broach blockage. No observations were made to indicate sever broach blockage or tube deposit loading to require immediate action.

Steam drum inspections were completed in two steam generators to assess the condition of following components. No anomalies were identified.

- (8) Secondary Moisture Separator Banks: Perforated Plate, Chevron Vanes and Drain Lines
- (16) Primary Moisture Separators: Swirl Vane Assemblies, Downcomer Barrel, Tangential Nozzles, Riser Barrel and Riser Barrel Slip Fit Joint
- (4) Decks: Upper, Mid, Intermediary and Lower Deck Plate
- Decking support structures
- (2) Ladders
- (1) Auxiliary Feedwater Piping

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