LICENSEE STEAM GENERATOR TUBE INSPECTION DISCUSSION INPUT

FALL 2021 STEAM GENERATOR TUBE INSPECTIONS

COMANCHE PEAK NUCLEAR POWER PLANT, UNIT 2

DOCKET NO. 50-446

Note: Vistra Operations Company, LLC (the licensee) provided input prior to the November 4, 2021, conference call with the U.S. Nuclear Regulatory Commission (NRC) regarding the ongoing steam generator (SG) tube inspection activities at Comanche Peak Nuclear Power Plant, Unit No. 2 (Comanche Peak, Unit 2), during refueling outage 19. The licensee input includes additional inspection details using the NRC supplied SG tube inspection discussion points template with the licensee providing responses in color.

The following discussion points have been prepared to facilitate the conference call arranged with the licensee to discuss the results of the steam generator tube inspections to be conducted during the upcoming Fall 2021, Comanche Peak Nuclear Power Plant, Unit No. 2 refueling outage. This conference call is scheduled to occur towards the end of the planned SG tube inspections, but before the unit completes the inspections and repairs.

The NRC staff plans to document a publicly available summary of the conference call, as well as any material that is provided in support of the call.

1. Discuss any trends in the amount of primary-to-secondary leakage observed during the recently completed cycle.
    a. No primary-to-secondary leakage during Cycle 19

2. Discuss whether any secondary side pressure tests were performed during the outage and the associated results.
    a. none.

3. Discuss any exceptions taken to the industry guidelines.
    a. none.

4. For each steam generator, provide a description of the inspections performed including the areas examined and the probes used (e.g., dents/dings, sleeves, expansion-transition, U-bends with a rotating probe), the scope of the inspection (e.g., 100 percent of dents/dings greater than 5 volts and a 20 percent sample between 2 and 5 volts), and the expansion criteria.
    a. 100% Bobbin full length inspection of tubes in all four SGs (straight legs only in Rows 1 and 2)
    b. 100% Bobbin inspection of tubes identified as potentially having high residual stress
    c. 100% Bobbin inspection of all prior indications of degradation and/or historical PLPs
    d. 100% +POINT probe inspection of HL TTS from +3.00 inches/-15.00 inches
    e. (H* distance = 14.01 inches)
    f. +POINT probe inspection HL TTS +3.00 inches/-15.00 inches of 100% of the peripheral tubes, including the open lane and T-slot, 2 pitches into the bundle. Data

acquisition shall continue as required to assure that the required distance below the tubesheet (15.00 inches) is adequately covered. (this is covered by the item above, but is retained for information)

g. +POINT probe inspection CL TTS +3.00 inches/-3.00 inches of 100% of the peripheral tubes, including the open lane and T-slot, 2 pitches into the bundle.
h. +POINT inspection of all HL and CL TSP locations and CL TTS +3 inches/-3 inches in tubes identified as potentially having high residual stress
i. 100% +POINT probe inspection of the U-bends in Rows 1 and 2 (same tubes as bobbin program)
j. 100% +POINT probe inspection of all dents/dings > 5.0 volts on HL and U-bend
k. 100% +POINT probe inspection of all dents/dings > 2.0 volts at and below TSP C7
l. 100% +POINT probe inspection of dents > 2.0 volts at H3 TSP
m. 100% +POINT inspection of tubes expanded at Preheater Baffle Plate (PBP) B
n. 100% +POINT probe inspection of tubes expanded at PBP D
o. +POINT probe inspection of legacy loose parts and PLPs
p. +POINT probe inspection of all I-code bobbin indications that are not resolved after history review
q. 100% Video/visual inspection of plugs in HL and CL
r. Video scan of the entire channel head bowl in HL and CL
s. TTS Visual Inspection in All SGs
t. Upper Tube Bundle Visual Inspection in SG 3
u. Preheater and Waterbox Visual Inspection in All SGs
v. Preheater Baffle Plate C2 Visual Inspection in SG4
w. Sludge Lance in All SGs
x. FOSAR TTS in All SGs
y. Secondary Side Gasket Replacement (as needed)
z. Foreign Object Retrievals / Possible Loose Part (PLP) verification.
aa. Scale Profiling

5. For each area examined (e.g., tube supports, dent/dings, sleeves, etc), provide the following:
    a. A summary of the number of indications identified to date for each degradation mode (e.g., number of circumferential primary water stress corrosion cracking indications at the expansion transition).
        i. One (1) Axial ODSCC at freespan ding
        ii. AVB Wear SG1-210, SG2~50, SG3~65, SG4-44
        iii. TSP Wear SG1-9, SG2~5, SG3~2, SG4-5
        iv. FOW SG1-0, SG2~1, SG3~1, SG4-9
    b. For the most significant indications in each area, provide an estimate of the severity of the indication (e.g., voltage, depth, and length of the indication), including whether tube integrity (structural and accident induced leakage integrity) was maintained during the previous operating cycle. In addition, discuss any analyses performed specifically for the most significant indications to demonstrate tube integrity.
        i. Structural and leakage integrity was maintained during Cycle 19
        ii. Axial ODSCC at freespan ding 62%TW, less than CM limit
        iii. Max AVB Wear 39%TW, less than CM limit

iv. Max TSP/PBP Wear 17%TW, less than CM limit
v. Max FOW 34%TW, less than CM limit

c. Discuss whether any location exhibited a degradation mode that had not previously been observed at this location at this unit (e.g., observed circumferential primary water stress corrosion cracking at the expansion transition for the first time at this unit).
i. Observed axial ODSCC at freespan ding for the first time

6. Describe repair/plugging plans.
a. 1 tube plugged for axial ODSCC at freespan ding in SG1
b. 2 tubes plugged for residual high stress in SG2
i. last two high stress tubes below row 10
ii. result of high stress tube analysis performed for deferral LAR

7. Describe in-situ pressure test and tube pull plans and results (as applicable and if available)
a. No in-situ pressure testing required
b. In-situ screening for Axial ODSCC
i. Flaw voltage (V_{PP} = 0.86V) greater than initial voltage screening value of 0.5V, but less than V_{THR-L} of 1.26V for axial ODSCC at freespan ding
ii. If $V_M \leq V_{THR-L}$ condition monitoring is met for leakage integrity and a leak test is not necessary
iii. Flaw axial length (0.2-inch) less than L_{STR} of 0.419-inch
iv. If $L \leq L_{STR}$ condition monitoring is met for structural integrity and a proof test is not necessary
c. No tube pulls

8. Discuss the following regarding loose parts:
a. The inspections performed to detect loose parts.
i. TTS Visual Inspection in All SGs
ii. Upper Tube Bundle Visual Inspection in SG 3
iii. Preheater and Waterbox Visual Inspection in All SGs
iv. Preheater Baffle Plate C2 Visual Inspection in SG4
v. Sludge Lance in All SGs
vi. FOSAR TTS in All SGs
b. A description of any loose parts detected and their location within the SG (including the source or nature of the loose part, if known).
i. See Table 1
c. If the loose parts were removed from the SG
i. See Table 1
d. Indications of tube damage associated with the loose parts
i. One (1) instance of new FOW from a loose part – two affected tubes 34%TW and 15%TW
ii. Wire mesh was located between two tube, 2-inches above Baffle Plate C2

9. Discuss the scope and results of any secondary side inspection and maintenance activities (e.g., in-bundle visual inspections, feedring inspections, sludge lancing, assessing deposit loading, etc).

a. See response to Question 8
b. Additionally, sludge lancing in all SG and scale profiling (completed post-outage)

10. Discuss any unexpected or unusual results.
    a. None

11. Provide the schedule for steam generator-related activities during the remainder of the current outage.
    a. ECT in SG2 and SG3 are scheduled to be completed on Saturday, November 6.

Table 1 - 2RF19 Foreign Object Log

SG No.	No.	Retrieval Status	Priority	Description	Leg / Region	General Location	Row	Col
SG1	FO1001	Retrieved	3	Wire Bristle	Cold Leg	Annulus	49	79
SG1	FO1002	Retrieved	2	Other - Shim material	Cold Leg	In Bundle	12	22
SG1	FO1003	Retrieved	3	Wire Bristle	Hot Leg	Annulus	6	1
SG1	FO1004	Retrieved	3	Other - Wire Mesh	Hot Leg	In Bundle	27	46
SG1	FO1005	Retrieved	2	Other - Shim material	Hot Leg	In Bundle	28	46
SG1	FO1006	Will Not Retrieve	3	Sludge Rock	Hot Leg	In Bundle	9	47
SG1	FO1007	Will Not Retrieve	3	Scale	Hot Leg	In Bundle	40	55
SG1	FO1008	Will Not Retrieve	3	Sludge Rock	Cold Leg	In Bundle	22	55
SG1	FO1009	Will Not Retrieve	3	Sludge Rock	Cold Leg	In Bundle	43	50
SG2	FO2001	Retrieved	3	Gasket Material	Hot Leg	Annulus	21	5
SG2	FO2002	Retrieved	3	Wire Bristle	Hot Leg	Annulus	13	3
SG4	FO4001	Will Not Retrieve	3	Sludge Rock	Cold Leg	Annulus	30	10
SG4	FO4002	Will Not Retrieve	3	Sludge Rock	Hot Leg	In Bundle	42	63
SG4	FO4003	Will Not Retrieve	3	Wire Bristle	Cold Leg	In Bundle	8	80
SG4	FO4004	Will Not Retrieve	3	Sludge Rock	Cold Leg	Annulus	44	23
SG4	FO4005	Will Not Retrieve	3	Sludge Rock	Cold Leg	Annulus	17	6
SG4	FO4006	Retrieved	2	Other - mesh	Hot Leg	Annulus	49	37
SG4	FO4007	Retrieved	3	Wire Bristle	Hot Leg	Annulus	49	47
SG4	FO4008	Attempted but not retrieved	3	Scale	Hot Leg	In Bundle	48	52
SG4	FO4009	Will Not Retrieve	3	Scale	Hot Leg	In Bundle	44	43
SG4	FO4010	Retrieved	2	Other - Unknown	Hot Leg	In Bundle	25	45
SG4	FO4011	Attempted but not retrieved	3	Sludge Rock	Hot Leg	In Bundle	27	44
SG4	FO4012	Retrieved	3	Other - WIRE	Cold Leg	Annulus	18	111
SG4	FO4013	Will Not Retrieve	3	Sludge Rock	Hot Leg	In Bundle	9	19
SG4	FO4014	Retrieved	1	Other - Mesh	Cold Leg	Preheater	44	43