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Status of Steam Generator Inspection Program April 11, 2000

The originally scheduled inspection of the steam generators is almost complete. We still have to pressure test 21 and 24-steam generator. The pressure test for 21 SG is scheduled for today, April 11, 2000. The pressure test of 24 SG is still on hold while Maintenance checks the MSIV bypass valves for leak by.

We have drilled out the two leaking PAP's and the one leaking mechanical plug in 23 SG. Once that is completed we will plug those three tubes and the one tube in 22 SG that leaked during In-situ pressure testing so we can return all of the steam generators to wet lay up. We still have to install plugs in all four-steam generators.

PRIMARY SIDE

| | | | | |
|-------------------------|---------|----------------|---------|----------|
| Special Interest +Point | Done | Done | Done | Done |
| Hi Frequency +Point 2 3 | Done | Done | Done | Done (4) |
| Re-Roll | Done | Done | Done | Done |
| Plug Rpl/Repair | Done | N/A | 1 left | Done |
| Denting # <610 Probe | 2 | 1 | 2 | None |
| Plugging | Waiting | Waiting | Waiting | 12 in HL |
| UT Testing | On Hold | Data Collected | On Hold | On Hold |
| In Situ Testing(5) | 1 of 1 | 4 of 4 | 5 of 5 | 11 of 11 |

- (1) 24 SG Fish Mouth Tube Break at Row 1 Column 6
- (2) 22 SG Three In Service Tubes leaked R45 Column 44 and Col 39 plus R44/C42
- (3) 23 SG Two already identified plugs leaked, R28/C38 and R20/C35, both PAP's
- (4) Measure Flow Slot Restriction for Stress Calculation, 0.5 in closure in row 1
- (5) 24 SG Found indications in R2/C4, R2/C71, R2/C74, Row 3 Clear
- (5) 24 SG R2/C4 and R2/C72 Passed,
R2C69 Leaked at test press. 5173 psi after 2 seconds. R2C71 only reached 4500 psi with max make up of 1.99 gpm.
R2C74 small leakage, at 5173 psi leak rate = 0.07 gpm
SG 23 - All passed, 22 SG R34/C51 Leaked at 4985 psig

B/34

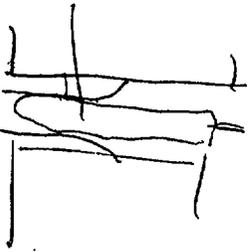
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Two significant eddy current testing (ECT) issues have developed and remain to be resolved. Each of these issues is further discussed.

6000 psig

1. Detection of indications in a "high noise" region at the top of the sludge pile.

Will use ultrasonic vice ECT



We have a section of tubes in our steam generators that have a high 'noise' background. The effect of this noise is that ECT may have difficulty detecting a 0.25 to 0.5-volt flaw that is masked by a background emitting 1-2 volts. Copper and oxide deposits on the outside surface of the tubes cause the high background signal. The area of concern is between the tube sheet and the first support plate extending for a distance of a foot or more.

Will specify tubes to be inspected

Action Plan

- A. A review of existing data for 22 SG will be performed data to assess the location of the high noise area. The tube sample needs to be determined and will be recommended by Westinghouse.
- B. A sample of high noise tube regions will be selected for testing by the ultrasonic test (UT) method, which is less, affected by surface deposits. The UT results will be compared to ECT to determine if ECT missed any flaw due to noise. Depending on the results we may have to expand the scope of the inspection but we have a method to quantify the concern and determine what needs to be done to address it.
- C. The UT process is slower and harder to use and can only inspect a foot or so of tube at a time. However, it is a process that can be used to address this concern.

Questions about qual package

In-situ'd axial indications

2. Detection of cracking in the tubesheet crevice

Cracks show up in Indication previously not detected by Cecco

During in situ pressure testing of SG 22 tube R34C51, this tube leaked during the test at a pressure of 4985 psig. Post in situ ECT detected the source of the leak as a previously identified ODSCC crack located about an inch above the tube sheet. In addition to this flaw a second crack found. The second crack was below the top of the tube sheet, just above the roll transition at the bottom of the tube. This crack appears to be several inches long and originates from the outside surface of the tube. There was no apparent indication of this crack in that area from previous ECT data. It is postulated that the in situ pressure test caused this defect to open axially, making it visible to ECT. Post in situ test ECT data indicates that the degradation mechanism is probably IGA (Intergranular Attack) from the secondary side of the tube. The pressure from the test cause the IGA to open axially.

20% throat Cecco probe

The prime concern is one of detectability and if more of these types of defects exist in the tube sheet crevice.

small OD cracks 0.2 in upto 1-2 inches

Similar For
① Phys
② Re-roll
③ Steel

20% throat Cecco probe
up 230

(300 tubes)
10% (22%)
of tubes in heat
log with point
of mill compare to Cecco.

Action Plan

A technique is being developed that utilizes recent Cecco probe data from the current inspect that was completed. By utilizing different frequency mixing techniques, it is believed that the presence of IGA in the tubesheet can be revealed. This technique has not yet been site qualified. Once qualified, analyst technique sheets will be developed and the training program will be revised. Analyst will then be trained.

The new ECT technique must also be validated. To validate the process 10% of the tubes in 22 SG hot leg crevice will be examined using both the Cecco and +-Point probes. Depending on the findings, this program may be expanded to 100% of hot leg tubes in 22SG as well as the remaining SGs.

Since IGA has also been detected in cold leg crevices at other plants, a sample of cold leg tubes will also be developed. The resulting information will have to be included in the condition monitoring and operational assessment report that is being developed by W.

The impact on cost and schedule has not yet been evaluated. Contingency plans for sleeving and for a tube pull to better define the condition (especially in the crevice) are being discussed. W is developing budgetary proposals for these contingencies.