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To: David Lew, Lawrence Doerflein
Date: Sun, Mar 26, 2000 1:53 PM
Subject: IP2 Steam Generator Tube Inspection Update

The attached status supercedes all previous updates.

Highlights:

1. The new high frequency probes arrived.
2. The licensee will decide whether to plug or re-roll (using F* criteria) tubes that have indications in the tube sheet area. This includes the three leakers in the 22SG.
3. Minimum number of additional tubes to be plugged, including plugging all Row 2 tubes, currently are:
21SG - 103
22SG - 58
23SG - 64
24SG - 89

CC: Brian Holian, Michael Modes, Pete Eselgroth, William Raymond

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STEAM GENERATOR TUBE TESTING STATUS

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I. BACKGROUND

- A. Each steam generator (SG) has 3,260 tubes.
- B. The number of tubes currently plugged are:
 - 1. SG21 - 313
 - 2. SG22 - 405
 - 3. SG23 - 301
 - 4. SG24 - 306

II. ITEMS OF NOTE

- A. The tube leak on SG24 was in Row 2, Column 5 and is currently reported as a 2" crack.
- B. The three new leaks discovered in SG 22 are in:
 - 1. Row 44, Column 42
 - 2. Row 45, Column 39
 - 3. Row 45, Column 44
 - 4. The leak was very slow - about 1 drop per 30 minutes for two tubes and 1 drop per 60 minutes for the third.
 - 5. The potential significance of the findings is that the ECT examinations had not identified defects in these tubes. The ECT data for one of the tubes had one finding categorized as non qualified indication (NQI) which had not yet been profiled with a RPC probe. Further licensee review of the ECT data for these tubes, as well as an engineering evaluation of the hydro results, continues.
 - 6. The 22SG has a reported leakage when operating at about 0.37 gpd.
 - 7. The location of the leak was the same on all three tubes and was at the tube to tube sheet fillet weld.
 - 8. This is the same issue described in NRC Information Notice 98-27. The Information Notice was written primarily for Once Thru Steam Generators (OTSG) but stated that the tube end cracking may not be limited to OTSGs.
 - 9. The leaks were detected using the mid-range +Point probe at 300 KHz. Picked up using RPC but cannot see with Cecco.
- C. The licensee is planning to redo all Row 2 & 3 tubes with the high frequency probe. They currently only have two probes but expect more to arrive on Sunday, 3/26,2000.
- D. There are two indications in the U bend area of 24SG that they are scheduled for insitu testing. No schedule date yet.
- E. The last table shown below, Pluggable Tube Summary, shows the minimum number of additional tubes that will be plugged for each SG. This includes all Row 2 tubes and all tubes that had indications at the support plates (SPI). Not identified are those tubes that had indications in the U bend area, sludge area and tube sheet area that will be retested using the high frequency probe. So the list of tubes to be plugged will grow. (I have requested a map of the tubes with the Support Plate Indications).
- F. For tubes with indications in the tube sheet area, including the three tubes in 22SG that leaked (see B above), a decision will be made later as to whether to plug those tubes or apply the F* criteria and re-roll the tubes. The decision will be based on cost/benefit and ALARA considerations.
- G. Work activities on Sunday are related to closing out open items, i.e., the retests identified on the tables below.
- H. The additional, new high frequency probes arrived early Sunday morning and are available to speed up the retests to be done using the new probes.

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III. TESTING STATUS

A. The number of tests to be conducted and their status is as follows:

1. Cecco Inspection Program:

SG	Tube Inspections	Tests Acquired	Tests Analyzed and Complete	Retests	Percent Complete	Total Remaining Inspections
21	3858	3781	3746	112	97.10%	77
22	3837	3699	3699	138	96.40%	138
23	3949	3827	3827	122	96.91%	122
24	3943	3942	3942	1	99.97%	1
Total	15587	15249	15214	373	97.61%	338

2. Bobbin Inspection Program:

SG	Tube Inspections	Tests Acquired	Tests Analyzed and Complete	Retests	Percent Complete	Total Remaining Inspections
21	4284	4284	4284	0	100.00%	0
22	4397	4396	4385	12	99.73%	1
23	4520	4518	4516	4	99.91%	2
24	4257	4257	4257	0	100.00%	0
Total	17458	17455	17442	16	99.91%	3

3. U-Bend +Point Inspection:

SG	Tube Inspections	Tests Acquired	Tests Analyzed and Complete	Retests	Percent Complete	Total Remaining Inspections
21	248	226	226	22	91.13%	22
22	184	159	159	25	86.41%	25
23	208	204	204	4	98.08%	4
24	227	173	173	54	76.21%	54
Total	867	762	762	105	87.89%	105

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4. B&W Roll Plug Inspection

SG	Tube Inspections	Tests Acquired	Tests Analyzed and Complete	Retests	Percent Complete	Total Remaining Inspections
21	57	56	56	1	98.25%	1
22	85	85	85	0	100.00%	0
23	10	10	10	0	100.00%	0
24	42	42	42	0	100.00%	0
Total	194	193	193	1	99.48%	1

5. Special Interest +Point Inspection:

SG	Tube Inspections	Tests Acquired	Tests Analyzed and Complete	Retests	Percent Complete	Total Remaining Inspections	Comments
21	180	26	0	0	0.00%	154	
22	203	0	0	0	0.00%	203	
23	130	0	0	0	0.00%	130	
24	137	137	137	0	100.00%	0	
Total	650	163	137	0	21.08%	487	

6. Special Interest Re-roll Candidate Inspection:

SG	Tube Inspections	Tests Acquired	Tests Analyzed and Complete	Retests	Percent Complete	Total Remaining Inspections	Comments
21	124	0	0	0	0.00%	124	
22	18	0	0	0	0.00%	18	
23	852	0	0	0	0.00%	852	
24	52	52	52	0	100.00%	0	
Total	1046	52	52	0	4.97%	994	

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7. All Programs Summary:

SG	Tube Inspections	Tests Acquired	Tests Analyzed and Complete	Retests	Percent Complete	Total Remaining Inspections	Comments
21	8751	8373	8312	135	94.98%	378	
22	8724	8339	8328	175	95.46%	385	
23	9669	8559	8557	130	88.85%	1110	
24	8658	8603	8603	55	99.36%	55	
Total	35802	33874	33800	495	94.41%	1928	

8. Pluggable Tube Summary:

Steam Generator	21	22	23	24	Total
Row 2 Tubes	72	49	45	57	223
SPI Indications	31	9	19	32	91
Total	103	58	64	89	314