



Crystal River Nuclear Plant
Docket No. 50-302
Operating License No. DPR-72

Ref: 10 CFR 50.36

October 19, 2001
3F1001-03

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Crystal River Unit 3 - Special Report 01-01, Once Through Steam Generator (OTSG) Notifications Required Prior to MODE 4

Reference: FPC to NRC Letter 3F0601-07, dated June 28, 2001, "Crystal River Unit 3 - Contingency Letter of Commitment Regarding License Amendment Request #252, Revision 0, Once Through Steam Generator Tube Surveillance Program, Tube Repair Roll (Re-Roll) Process" (TAC No. MB1519)

The purpose of this letter is to submit Special Report 01-01, Once Through Steam Generator (OTSG) Notifications Required Prior to MODE 4. The report contains information regarding the inservice inspection of the Crystal River Unit 3 (CR-3) OTSG tubes performed during Refueling Outage 12. This special report is being submitted prior to ascension into MODE 4 as required by Improved Technical Specification (ITS) 5.7.2.c. The report contains the following information:

1. Number of tubes plugged and repaired;
2. Crack-like indications and assessment of growth for indications in the first span;
3. Results of in-situ pressure testing if performed; and
4. Number of tubes and axially oriented TEC (tube end crack) indications left in-service, the projected accident leakage, and an assessment of growth for TEC indications.

Special Report 01-01 also provides information to satisfy commitments made by Florida Power Corporation (FPC) in the referenced letter to provide the best estimate total leakage that would result from an analysis of the limiting Large Break Loss-of Coolant Accident (LBLOCA) based on as-found circumferential cracking in the original tube-to-tubesheet rolls, tube-to-tubesheet re-roll repairs, and the zones adjacent to the seal welds. The inspection results were discussed with the NRC staff on October 17, 2001.

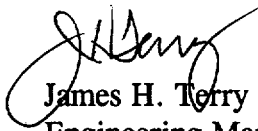
Based on results from the Refueling Outage OTSG tube inspection, a Condition Monitoring Assessment was performed which shows that structural and leakage integrity requirements for degraded tubing were met for the last cycle of operation. The Operational Assessment performed shows that structural and leakage integrity requirements will be met over the next full cycle of operation (24 months).

A001
Rec'd 12/26/01

This letter establishes no new regulatory commitments.

If you have any questions regarding this submittal, please contact Mr. Sid Powell, Supervisor, Licensing and Regulatory Programs at (352) 563-4883.

Sincerely,



James H. Terry
Engineering Manager

JHT/lvc

Attachment:

Special Report 01-01, Once Through Steam Generator Notifications Required Prior to MODE 4

xc: NRR Project Manager
Regional Administrator, Region II
Senior Resident Inspector

ATTACHMENT

SPECIAL REPORT 01-01

ONCE THROUGH STEAM GENERATOR

NOTIFICATIONS REQUIRED

PRIOR TO MODE 4

SPECIAL REPORT 01-01

ONCE THROUGH STEAM GENERATOR NOTIFICATIONS REQUIRED PRIOR TO MODE 4

The Refueling Outage 12 (12R) inspection scope of the Once Through Steam Generator (OTSG) tubes included:

- 100% full length bobbin inspection of all tubes inservice in both OTSGs;
- 100% upper roll transition of non-sleeved tubes inservice using motorized rotating pancake coil/Plus Point (MRPC);
- 100% Plus Point inspection of the defined critical area in the lower tube sheet region, and surrounding buffer zone of both OTSGs;
- 20% Plus Point random sample inspection of the remaining dented tubes within the Kidney Region of both OTSGs;
- 40% bobbin inspection of inservice sleeves in "A" OTSG;
- 100% Plus Point inspection of "B" OTSG, and 20% of "A" OTSG, inservice sleeves roll transition area;
- 20% sample MRPC exam (15th tube support plate and upper tubesheet) of the Lane/Wedge Region including a boundary around this region;
- 100% MRPC of Inconel-600 plugs in both OTSGs;
- 100% MRPC of the post-fabrication re-rolled tubes in both OTSGs;
- 100% MRPC of dings adjacent to explosively plugged tubes in both OTSGs;
- 100% MRPC inspection of inservice tubes with pit-like intergranular attack (IGA) in the first span of "B" OTSG;
- 100% visual inspection of installed plugs to identify evidence of leakage; and
- 20% sample MRPC of dents from the second tube support plate to the upper tubesheet.

The requirements from Improved Technical Specification 5.7.2.c, and Florida Power Corporation (FPC) regulatory commitments from FPC to NRC letter 3F0601-07 dated June 28, 2001, Crystal River Unit 3 - Contingency Letter of Commitment Regarding License Amendment Request #252, Revision 0, Once Through Steam Generator Tube Surveillance Program, Tube Repair Roll (Re-Roll) Process (TAC No. MB1519) are restated in *Italics* below.

ITS 5.7.2.c requirements

“Following each inservice inspection of steam generator (OTSG) tubes, the NRC shall be notified of the following prior to ascension into MODE 4:

1. *Number of tubes plugged and repaired*

OTSG	NUMBER OF TUBES		
	PLUGGED	RE-ROLLED	SLEEVED
A	14	53	0
B	27	256	0

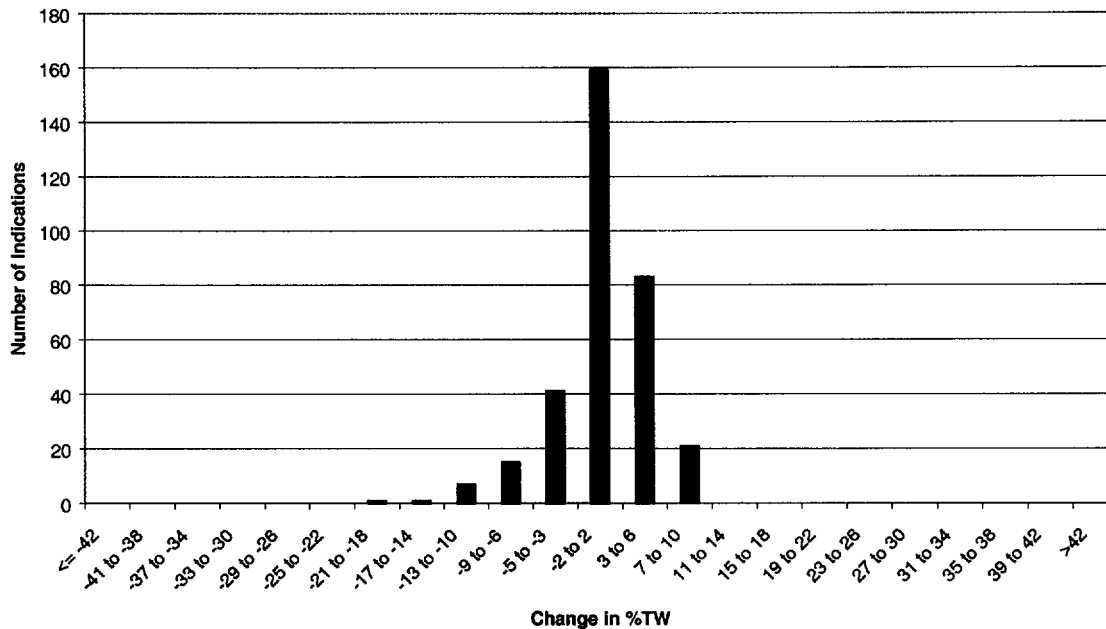
2. *Crack-like indications and assessment of growth for indications in the first span*

First span Crack-like Indications	
OTSG	Number of Indications
A	0
B	0

The first span is defined as OTSG tubing spanning from the secondary face of the lower tubesheet to the first support plate.

As required by technical specification 5.6.2.10.4.c, inservice tubes with pit-like intergranular attack (IGA) have been monitored for growth by using a test probe equivalent to the high frequency bobbin probe used in 1997. For the tubes with known first span IGA in the “B” OTSG (154), the percent through-wall (%TW) change for these indications was determined. Regression data for the current and the 1997 inspection were compared for the growth evaluation. Figure 1 contains this evaluation. The range was from -18%TW to 9%TW, with the average change at 0.61%TW. This demonstrates the continued dormancy of these indications relative to their depth. None of these tubes were plugged due to %TW greater than 40% and none were plugged due to change of greater than 10%. No tubes were plugged due to multiple volumetric IGA indications. As a result of the inspections performed in 2001, additional tubes were located in “B” OTSG containing first span IGA indications. Their evaluation will be presented in the 90-day report. Of the 154 tubes affected by IGA prior to the inspection, 154 remain in service in “B” OTSG.

**1st Span Indications
Change in %TW from 1997 to 2001**



3. *Results of in-situ pressure testing, if performed*

In-situ pressure testing was performed on one tube in “A” OTSG to above three times the normal operating differential pressure. No leakage was detected during the test. The following table provides information regarding the tube, indications and test pressure:

OTSG	Row	Tube	Flaw Type	Location (inches)	Depth (% TW)	Length (inches)	Max Test Pressure (psig)
A	45	3	SAI	15S + 2.46	68	2.27	4250
				15S - 7.38	76	0.16	
				15S - 9.54	80	0.29	
				15S - 9.92	63	0.25	
				15S - 10.2	52	0.20	
				15S - 10.6	70	0.25	
				15S - 11.5	70	0.20	
				15S - 11.7	95	0.13	
				15S - 13.8	86	0.31	

Note:
SAI - Single Axial Indications

4. *Number of tubes and axially oriented TEC (tube end crack) indications left in-service, the projected accident leakage, and an assessment of growth for TEC indications.*

During the 1999 inspection, CR-3 implemented an alternate repair criteria (ARC) for tube end cracking, documented in BAW-2346P, Revision 0. During the 2001 inspection, an assessment of growth of TEC indications that remained inservice was performed for the indicated location of the flaw tip relative to the upper tubesheet carbon/clad interface (CCI). This evaluation confirmed that the indications did not show significant growth toward the interface. Table 1 provides the results of that evaluation. Figure 1 provides a graphical representation of the results of the assessment. The results demonstrate that growth towards the CCI is not significant with the average change in flaw tip location of -0.01 for both OTSGs. Table 2 provides the number of tubes, and indications returned to service under the ARC for cycle 13. As part of the ARC, the total projected leak rate under postulated accident (MSLB) conditions is provided in Table 3.

Table 1: TEC Flaw Tip Change Relative to CCI

OTSG	Maximum Positive Change (inches)	Maximum Negative Change (inches)	Average Change (inches)
A	0.15	-0.21	-0.01
B	0.25	-0.19	-0.01

**Figure 1: Both - OTSGs
Change in Flaw Tip Location
1999 to 2001**

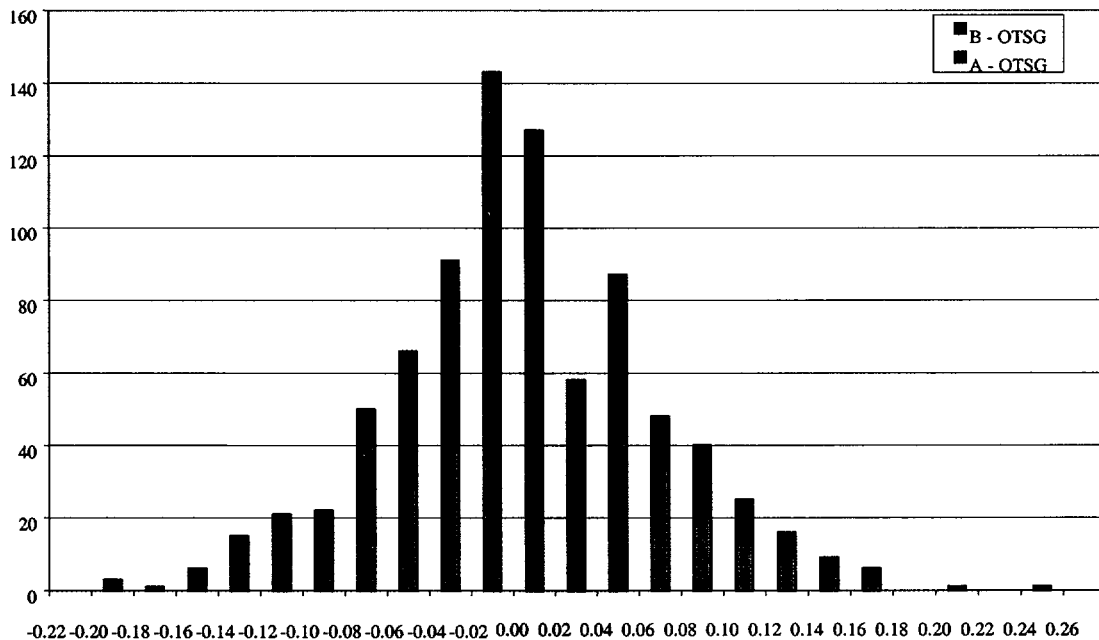


Table 2: Number of TEC Tubes for Cycle 13*

OTSG	Tubes Left In Service	Indications
A	830	1118
B	675	840

Note: TECs in tubes that were repaired by either re-roll or plugging have been removed from this table since they no longer have leakage assigned to them for Cycle 13.

Table 3: Cycle 13 Projected Accident Leakage (MSLB) for TECs

OTSG	Projected Accident Leakage		
	Leakage Contribution at Room Temperature From In-Service TEC Assuming 100% TW	Leakage Contribution at Room Temperature from Undetected 100% TW Indications Based on POD of 0.84	Total Leakage at Room Temperature for Accident Conditions
A	0.564 gpm	0.109 gpm	0.673 gpm
B	0.556 gpm	0.154 gpm	0.710 gpm

Regulatory Commitments

Following each inservice inspection of steam generator tubes but prior to returning the CR-3 steam generators to service, Florida Power Corporation (FPC) will verbally notify the NRC of the following:

- a. *Number of tubes with circumferential cracking indications inboard of the roll repair.*

OTSG "A" = 0
OTSG "B" = 11

- b. *Number of tubes with circumferential cracking indications in the original roll region, including the zone adjacent to the tube-to-tubesheet seal weld if no re-roll is present.*

OTSG "A" = 33 (12R), 460 (11R)
OTSG "B" = 125 (12R), 699 (11R)

- c. *Determination of the best estimate total leakage that would result from an analysis of the limiting LBLOCA based on as-found circumferential cracking in the original tube-to-tubesheet rolls, tube-to-tubesheet re-roll repairs, and the zones adjacent to the seal welds.*

The best estimate leak rate from degradation near upper tubesheet rolls is 0.82 gpm in "A" OTSG, and 3.58 gpm in "B" OTSG.

Summary

A Condition Monitoring Assessment was performed which shows that structural and leakage integrity requirements for degraded tubing were met for the last cycle of operation. The Operational Assessment shows that structural and leakage integrity requirements will be met over the next full cycle of operation (24 months).