Florida
Power
CORPORATION
Crystal River Unit 3
Docket No. 50-302

October 14, 1993
3F1093-08

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Subject: Presentation of Steam Generator Tube Inspection Requirements within the CR-3 Improved Technical Specifications

Dear Sir:

Florida Power Corporation (FPC) and the NRC Staff re-initiated efforts to finalize the Crystal River Unit 3 (CR-3) Improved Technical Specifications (ITS) in October 1992. Since that time, the content and presentation of technical specification steam generator (OTSG) tube inspection requirements has been discussed on a number of occasions and in various forums, but has remained an open item.

This letter provides FPC's preference on the presentation of OTSG tube inspection requirements within the CR-3 ITS (Attachment 1) as well as the reasons for selecting this presentation (Attachment 2). FPC anticipates the NRC Staff will utilize the information provided in this letter and attachments to expedite resolution of the issue in support of the current November 1, 1993 milestone for issuance of the CR-3 ITS license amendment. The attachments reflect current CR-3 Technical Specification requirements and maintenance practices. No new or alternate inspection technology is proposed at this time.

The decision to translate current tube inspection requirements to the ITS format transformed the tube inspection issue to one of presentation preference. During development of the restructured Standard Technical Specifications (STS) and the CR-3 ITS, NRC management deferred to industry preference on presentation issues. This practice is based on the assumption that the industry is best-equipped to translate requirements into a language the operators will understand. The presentation of OTSG inspection requirements is a similar situation and the same considerations should apply.

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FPC remains strongly committed to maintaining the current November 1, 1993 schedule for issuance of the CR-3 ITS license amendment. Should you require additional information to support this schedular milestone, please do not hesitate to contact me.

Sincerely,

P. M. Beard, Jr.
Senior Vice President
Nuclear Operations

PMB/BPW:ff
Attachments

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

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.12 RCS Operational LEAKAGE

LCO 3.4.12 RCS operational LEAKAGE shall be limited to:

a. No pressure boundary LEAKAGE;

b. 1 gpm unidentified LEAKAGE;

c. 10 gpm identified LEAKAGE; and

d. 1 gpm total primary to secondary LEAKAGE through all steam generators (OTSGs).

Two OTSGs shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. RCS LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE.	A.1	Reduce LEAKAGE to within limits.	4 hours
B. Required Action and associated Completion Time not met. OR Pressure boundary LEAKAGE exists.	B.1 AND B.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	----------NOTE---------- Not required to be performed in MODE 4. Not required in MODE 3 until 12 hours of steady state operation. ---------- Perform RCS water inventory balance during steady state operation.	72 hours
SR 3.4.12.2	Verify steam generator tube integrity is in accordance with the Steam Generator Tube Surveillance Program.	In accordance with the Steam Generator Tube Surveillance Program.

5.6 Procedures, Programs and Manuals

5.6.2.9 Inservice Testing Program (continued)

a. Provisions that inservice testing of ASME Code Class 1, 2, and 3 pumps, valves, and snubbers shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a;

b. Testing frequencies specified in Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda;

c. The provisions of SR 3.0.2 are applicable to the above required Frequencies for performing inservice testing activities;

d. The provisions of SR 3.0.3 are applicable to inservice testing activities; and

e. Nothing in the ASME Boiler and Pressure Vessel Code shall be construed to supersede the requirements of any TS.

5.6.2.10 Steam Generator (OTSG) Tube Surveillance Program

Each OTSG shall be demonstrated OPERABLE by performance of the following augmented inservice inspection program.

1. Each OTSG shall be determined OPERABLE during shutdown by selecting and inspecting at least the minimum number of OTSGs specified in Table 5.6.2-1.

2. The OTSG tube minimum sample size, inspection result classification, and the corresponding action required shall be as specified in Table 5.6.2-2. The inservice inspection of OTSG tubes shall be performed at the frequencies specified in Specification 5.6.2.10.3 and the inspected tubes shall be verified acceptable per the acceptance criteria of Specification 5.6.2.10.4. The tubes selected for each inservice inspection shall include at least 3% of the total number of tubes in all OTSGs. The tubes selected for these inspections shall be selected on a random basis except:

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5.6 Procedures, Programs and Manuals

5.6.2.10 OTSG Tube Surveillance Program (continued)

a. Where experience in similar plants with similar water chemistry indicates critical areas to be inspected, then at least 50% of the tubes inspected shall be from these critical areas.

b. The first inservice inspection (subsequent to the preservice inspection) of each OTSG shall include:

1. All nonplugged tubes that previously had detectable wall penetrations (>20%), and

2. Tubes in those areas where experience has indicated potential problems.

c. The second and third inservice inspections may be less than a full tube inspection by concentrating (selecting at least 50% of the tubes to be inspected) the inspection on those areas of the tube sheet array and on those portions of the tubes where tubes with imperfections were previously found.

d. Tubes in specific limited areas which are distinguished by unique operating conditions or physical construction may be excluded from random samples if all such tubes in the specific area of an OTSG are inspected with the inspection result classification and the corresponding action required as specified in Table 5.6.2-3. No credit will be taken for these tubes in meeting minimum sample size requirements. Degraded or defective tubes

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5.6 Procedures, Programs and Manuals

5.6.2.10 OTSG Tube Surveillance Program (continued)

found in these areas will not be considered in determining the inspection results category as long as the mode of degradation is unique to that area and not random in nature.

The results of each sample inspection shall be classfied into one of the following three categories:

----------NOTE----------
In all inspections, previously degraded tubes whose degradation has not been spanned by a sleeve must exhibit significant (>10%) further wall penetrations to be included in the below percentage calculations.

Category	Inspection Results
C-1	Less than 5% of the total tubes inspected are degraded tubes and none of the inspected tubes are defective.
C-2	One or more tubes, but not more than 1% of the total tubes inspected are defective, or between 5% and 10% of the total tubes inspected are degraded tubes.
C-3	More than 10% of the total tubes inspected are degraded tubes or more than 1% of the inspected tubes are defective.

3. The above-required inservice inspections of OTSG tubes shall be performed at the following frequencies:

   a. Inservice inspections shall be performed at intervals of not less than 12 nor more than 24 calendar months after the previous inspection. If two consecutive inspections following service under all volatile treatment (AVT) conditions, not including the preservice inspection, result in all inspection results

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5.6 Procedures, Programs and Manuals

5.6.2.10 OTSG Tube Surveillance Program (continued)

falling into the C-1 category, or if two consecutive inspections demonstrate that previously observed degradation has not continued and no additional degradation has occurred, the inspection interval may be extended to a maximum of once per 40 months.

b. If the inservice inspection of an OTSG, conducted in accordance with Table 5.6.2-2 or Table 5.6.2-3 requires a third sample inspection whose results fall in Category C-3, the inspection frequency shall be reduced to at least once per 20 months. The reduction in inspection frequency shall apply until a subsequent inspection demonstrates that a third sample inspection is not required.

c. Additional unscheduled inservice inspections shall be performed on each OTSG in accordance with the first sample inspection specified in Table 5.6.2-2 or Table 5.6.2-3 during the shutdown subsequent to any of the following conditions:

1. Primary-to-secondary tube leaks (not including leaks originating from tube-to-tube sheet welds) in excess of the limits of Specification 3.4.12,

2. A seismic occurrence greater than the Operating Basis Earthquake,

3. A loss-of-coolant accident requiring actuation of the engineered safeguards, or

4. A main steam line or feedwater line break.

4. Acceptance criteria:

a. Vocabulary as used in this Specification:

1. Tubing or Tube means that portion of the tube or sleeve which forms the primary system to secondary system pressure boundary.

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5.6 Procedures, Programs and Manuals

5.6.2.10 OTSG Tube Surveillance Program (continued)

2. Imperfection means an exception to the dimensions, finish or contour of a tube from that required by fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections.

3. Degradation means a service-induced cracking, wastage, wear, or general corrosion occurring on either inside or outside of a tube.

4. Degraded Tube means a tube containing imperfections $\geq$ 20% of the nominal wall thickness caused by degradation except where all such degradation has been spanned by the installation of a sleeve.

5. % Degradation means the percentage of the tube wall thickness affected or removed by degradation.

6. Defect means an imperfection of such severity that it exceeds the plugging/sleeving limit except where the imperfection has been spanned by the installation of a sleeve. A tube containing a defect in its pressure boundary is defective. Any tube which does not permit the passage of the eddy-current inspection probe shall be deemed a defective tube.

7. Plugging/Sleeving Limit means the imperfection depth at or beyond which the tube shall be restored to serviceability by the installation of a sleeve or removed from service because it may become unserviceable prior to the next inspection and is equal to 40% of the nominal tube or sleeve wall thickness. No more than five thousand sleeves may be installed in each OTSG.

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5.6 Procedures, Programs and Manuals

5.6.2.10 OTSG Tube Surveillance Program (continued)

8. Unserviceable describes the condition of a tube if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operating Basis Earthquake, a loss-of-coolant accident, or a main steam line or feedwater line break, as specified in 5.6.2.10.3.c, above.

9. Tube Inspection means an inspection of the entire OTSG tube as far as possible.

b. The OTSG shall be determined OPERABLE after completing the corresponding actions (plug or sleeve all tubes exceeding the plugging/sleeving limit and all tubes containing through-wall cracks) required by Table 5.6.2-2 (and Table 5.6.2-3 if the provisions of Specification 5.6.2.10.2.d are utilized). Defective tubes may be repaired in accordance with the B&W process (or method) equivalent to the method described in report BAW-2120P.

5.6.2.11 Secondary Water Chemistry Program

This program provides controls for monitoring secondary water chemistry to inhibit steam generator tube degradation and low pressure turbine disc stress corrosion cracking. The program shall include:

a. Identification of a sampling schedule for the critical variables and control points for these variables;

b. Identification of the procedures used to measure the values of the critical variables;

c. Identification of process sampling points, which shall include monitoring the discharge of the condensate pumps for evidence of condenser in leakage;

d. Procedures for the recording and management of data;

e. Procedures defining corrective actions for all off control point chemistry conditions; and

(continued)

TABLE 5.6.2-1 (page 1 of 1)
MINIMUM NUMBER OF STEAM GENERATORS (OTSGs) TO BE INSPECTED
DURING INSERVICE INSPECTION

Preservice Inspection	Yes
Number of OTSGs	Two
First Inservice Inspection	One
Second and Subsequent Inservice Inspections	One[1]

[1] The inservice inspection may be limited to one OTSG on a rotating schedule encompassing 6% of the tubes if the results of the first or previous inspections indicate that both OTSGs are performing in a like manner. Note that under some circumstances, the operating conditions in one OTSG may be found to be more severe than those in the other OTSG. Under such circumstances the sample sequence shall be modified to inspect the most severe conditions.

TABLE 5.6.2-2 (page 1 of 1)
OTSG TUBE INSPECTION

1st Sample Inspection			2nd Sample Inspection		3rd Sample Inspection	
Sample Size	Result	Action Required	Result	Action Required	Result	Action Required
A minimum of S tubes per OTSG	C-1	None	N/A	N/A	N/A	N/A
	C-2	Plug or sleeve defective tubes and inspect an additional 2S tubes in this OTSG.	C-1	None	N/A	N/A
			C-2	Plug or sleeve defective tubes and inspect additional 4S tubes in this OTSG.	C-1	None
					C-2	Plug or sleeve defective tubes.
					C-3	Perform action for C-3 result of first sample.
			C-3	Perform action for C-3 result of first sample.	N/A	N/A
	C-3	Inspect all tubes in this OTSG, plug or sleeve defective tubes, inspect 2S tubes in each other OTSG, and notify NRC per 10CFR50.72	All other OTSGs are C-1	None	N/A	N/A
			Some OTSGs C-2 but no additional OTSGs are C-3	Perform action for C-2 result of second sample.	N/A	N/A
			Additional OTSG is C-3	Inspect all tubes in each OTSG, plug or sleeve defective tubes, and notify NRC per 10CFR50.72.	N/A	N/A

S = 3 N/n % Where N is the number of OTSGs in the unit and n is the number of OTSGs inspected during inspection period.

TABLE 5.6.2-3 (page 1 of 1)
SPECIFIC LIMITED AREA INSPECTION

1st Sample Inspection of a "Specific Limited Area"			2nd Sample Inspection of a "Specific Limited Area"	
Sample Size	Result	Action Required	Result	Action Required
100% of area in both OTSGs	C-1	None	N/A	N/A
	C-2	Plug or sleeve defective tubes.	N/A	N/A
	C-3	Plug nr sleeve defective tubes.	N/A	N/A
100% of area in one OTSG	C-1	None	N/A	N/A
	C-2	Plug or sleeve defective tubes and inspect 100% of corresponding area in other OTSG	C-1	None
			C-2	Plug or sleeve defective tubes.
			C-3	Plug or sleeve defective tubes.
	C-3	Plug or sleeve defective tubes and inspect 100% of corresponding area in other OTSG.	C-1	None
			C-2	Plug or sleeve defective tubes.
			C-3	Plug or sleeve defective tubes.

5.7 Reporting Requirements (continued)

5.7.2 Special Reports

Special Reports shall be submitted in accordance with 10 CFR 50.4 within the time period specified for each report.

The following Special Reports shall be submitted:

a. When a Special Report is required by Condition B or G of LCO 3.3.17, "Post Accident Monitoring (PAM) Instrumentation," a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status.

b. Any abnormal degradation of the containment structure detected during the tests required by the Containment Tendon Surveillance Program shall be reported to the NRC within 30 days. The report shall include a description of the tendon condition, the condition of the concrete (especially at tendon anchorages), the inspection procedures, the tolerances on cracking, and the corrective action taken.

c. Following each inservice inspection of steam generator (OTSG) tubes, the number of tubes plugged and sleeved in each OTSG shall be reported to the NRC within 15 days.

   The complete results of the OTSG tube inservice inspection shall be submitted to the NRC within 12 months following the completion of the inspection. The report shall include:

   1. Number and extent of tubes inspected,

   2. Location and percent of wall-thickness penetration for each indication of an imperfection, and

   3. Identification of tubes plugged and tubes sleeved.

   Results of OTSG tube inspections that fall into Category C-3 shall be reported to the NRC prior to resumption of plant operation. This report shall provide a description of investigations conducted to determine cause of the tube degradation and corrective measures taken to prevent recurrence.

Discussion of Proposed Presentation of OTSG Tube Inspection Requirements within the CR-3 ITS

The major aspects of Technical Specification OTSG tube inspection requirements are discussed individually below.

Limiting Condition for Operation (LCO):

A single LCO will be revised to include the requirement that the OTSGs are operable during operational modes 1,2,3 and 4. FPC proposes to modify current ITS LCO 3.4.12 "RCS Operation LEAKAGE" to accomplish this purpose. While a tube imperfection is not necessarily analogous to leakage, the two are directly related. In fact, more restrictive limits on primary to secondary leakage through the steam generators is a critical aspect of steam generator maintenance programs recently approved by the Commission. Thus, the combination of the two requirements within this one LCO is logical.

FPC considered and dismissed the creation of a separate LCO to address OTSG tube inspection requirements since this would be done for no other reason than to provide a place holder for the requirement the 'OTSG shall be operable'. The administrative burden associated with creating a new LCO outweighed any philosophical presentation issues. In particular, a stand alone LCO would necessitate the creation of an entire corresponding Bases section. Given the complex, technical nature of this issue, this is a potentially significant task. NRC Staff resources necessary to review the proposed Bases could also be significant. Copying the Bases for the current CR-3 TS into the ITS was also considered and dismissed. Such an approach would result in one Technical Specification Bases out of approximately 100 which was markedly different and inconsistent with the balance of the ITS.

Required Action:

Current CR-3 steam generator technical specification 3/4.4.5, Action 'a', requires that "with one or more steam generators inoperable due to steam generator tube imperfections, restore the inoperable generator(s) to OPERABLE status prior to increasing T_{ave} >200°F." This Action addresses the appropriate contingencies in the event a OTSG tube defect is discovered while in cold shutdown or refueling and is basically a re-statement of current CR-3 Technical Specification 3.0.4. The ITS contains a similar requirement in LCO 3.0.4 such that this Required Action need not be specifically written. To do so would be inconsistent with the balance of the ITS.

Current CR-3 Technical Specifications do not contain an Action to address tube imperfections discovered in operational modes 1,2,3 or 4. Plants with steam generator technical specification requirements similar to CR-3, who have discovered such a problem during power operation, have interpreted this condition as a technical specification 3.0.3 entry. This interpretation has placed large administrative burdens on both the licensee and the NRC. During recent discussions with the NRC Staff there has been common agreement that certain program errors, in particular those that are administrative in nature, do not warrant an immediate shutdown. However, the development of the Conditions and

Required Actions to address these situations is ongoing and not expected to be resolved to support the November 1 issuance date for the CR-3 ITS license amendment. Therefore, we do not propose to modify the CR-3 ITS to address the situation at this time.

The discussion of the Required Action aspect also highlights another difficulty with creating a new LCO. The LCO would require the creation of a Required Action.

Surveillance Requirement (SR):

A single SR in the RCS operational leakage technical specification will implement the OTSG tube inspection surveillances. The surveillances in the current CR-3 technical specifications will be relocated to an ITS Section 5.0 "Administrative Controls" Program description. This presentation is consistent with the August 12, 1993 NRC/Industry TSIP Executive Meeting decision in which NRR senior management concurred with the presentation of OTSG tube inspection requirements as an administrative control program. The administrative controls program description is a restatement of current CR-3 technical specification inspection requirements.

The latest draft of the CR-3 ITS already contains the SR in the RCS operational leakage technical specification. Thus, this approach will have the least impact on implementation efforts and schedule.

Reporting Requirements:

Current CR-3 Technical Specification 4.4.5.5 "Reports" will be located to the Special Report Section of the CR-3 ITS. The ITS reporting requirements will be consistent with current CR-3 Technical Specifications.

Bases:

The "RCS Operational Leakage" Bases (not provided) will be reviewed and revised as appropriate to address the addition of the OTSG OPERABILITY Requirement to the LCO.