FPL

MAR 1 1 2003

L-2003-067
EA-03-09(IV)(F)(2)

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Re: Turkey Point Unit 3
Docket No. 50-250
Order (EA-03-009) Relaxation Request
Examination Coverage of Reactor Pressure Vessel Head
Penetration Nozzles

On February 11, 2003 the NRC issued Order (EA-03-009) requiring specific inspections of the reactor pressure vessel (RPV) head and associated penetration nozzles at pressurized water reactors. Pursuant to the procedure specified in Section IV, paragraph F of the Order, Florida Power & Light (FPL) hereby requests relaxation from the requirements specified in Section IV, paragraph C.(1)(b)(i) for Turkey Point Unit 3 for the Reactor Vessel Head (RPVH) penetration nozzles for which ultrasonic testing requirements could not be completed as required. FPL is in the process of completing the RPVH penetration nozzle inspection, therefore, this submittal reflects results up to date. If required, FPL will submit supplemental data by March 13, 2003, upon completion of the RPVH penetration nozzle inspection.

As demonstrated in the attachment hereto, the requested relaxation meets item IV.F.(2) of the Order, as compliance with this Order for the specific nozzles would result in hardship or unusual difficulty without a compensating increase in the level of quality or safety.

FPL requests approval of the subject relaxation by March 15, 2003, the currently scheduled date for Turkey Point Unit 3 reactor re-assembly. The refueling outage completion is currently scheduled for March 19, 2003.

Please contact Walter Parker at (305) 246-6632 if there are any questions about the relaxation.

Very truly yours,

William Jefferson, Jr.
Vice President
Turkey Point Plant

Attachment

cc: Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant
Florida Department of Health and Rehabilitative Services

A101

TURKEY POINT UNIT 3 RELAXATION REQUEST FROM US NRC Order EA-03-009

"Hardship or Unusual Difficulty without Compensating Increase in Level of Quality or Safety"

1. ASME COMPONENTS AFFECTED

Turkey Point (PTN) Unit 3 has 66 ASME Class 1 reactor pressure vessel (RPV) head penetrations (including the vent).

The Turkey Point Unit 3 Order Inspection Category in accordance with Section (IV.A.) is currently determined as "high" based on 18.3 EDY at this refueling outage[1] (RFO).

FPL Drawing No. 5610-M-400-57, Sheet 1, Rev. 2 (PTN-3)

2. US NRC ORDER EA-03-009 APPLICABLE EXAMINATION REQUIREMENTS:

The NRC issued an Order[2] on Februay 11, 2003 establishing interim inspection requirements for reactor pressure vessel heads of pressurized water reactors. Section IV.C. of the Order states the following :

All Licensees shall perform inspections of the RPV head using the following techniques and frequencies :
(1) For those plants in the High category, RPV head and head penetration nozzle inspections shall be performed using the following techniques every refueling outage
- (a) Bare metal visual examination of 100% of the RPV head surface (including 360° around each RPV head penetration nozzle), AND
- (b) Either:
  - (i) Ultrasonic testing of each RPV head penetration nozzle (i.e., nozzle base material) from two (2) inches above the J-groove weld to the bottom of the nozzle and an assessment to determine if leakage has occurred into the interference fit zone, OR

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[1] FPL letter L-2002-185, "St. Lucie Units 1 and 2, Docket Nos. 50-335, 50-389, Turkey Point Units 3 and 4, Docket Nos. 50-250 and 50-251, Response to NRC Bulletin 2002-02, Reactor Pressure Vessel Head Penetration Nozzle Inspection Programs," R. S. Kundalkar to NRC, September 11, 2002.

[2] US NRC Letter EA-09-009, "Issuance Of Order Establishing Interim Inspection Requirements For Reactor Pressure Vessel Heads At Pressurized Water Reactors,", from Samuel J. Collins (NRC) to all Pressurized Water Reactor Licensees, Dated February 11, 2003.

(ii) Eddy current testing or dye penetrant testing of the wetted surface of each J-Groove weld and RPV head penetration nozzle base material to at least two (2) inches above the J-groove weld.

Relaxation is requested from part IV.C.(1)(b)(i) of the Order to perform ultrasonic testing (UT) of the RPV head penetration inside the tube from 2 inches above the J-groove weld to the bottom of the penetration at Turkey Point Unit 3. Specifically, the relaxation is related to UT examination of a limited portion of the non-pressure boundary portion of the RPV penetration nozzle greater than 1 inch below the weld to the bottom of the nozzle.

3. REASON FOR REQUEST:

Pursuant to Order Section IV.F.(2) "Compliance with the Order for specific nozzles would result in hardship or unusual difficulty, without a compensating increase in the level of quality and safety", FPL is requesting this relaxation for Turkey Point Unit 3. Currently, with 48 of 66 RPV nozzle penetrations examined, there are 6 RPV head penetrations that contain areas of coverage less than that required by the NRC Order. The Order requires examination from 2 inches above the J-groove weld to the bottom of the RPV head penetration nozzle. The reduced coverage is caused by nozzle configuration, and limitations of the probe design used for the Ultrasonic (UT) examination. Specifically, actual coverage below the weld, in the non-pressure boundary portion of the nozzle, did not in all cases, extend to the "bottom of the nozzle." A typical example of the UT cover area, with the area of missed coverage identified, is shown in Figure 1.

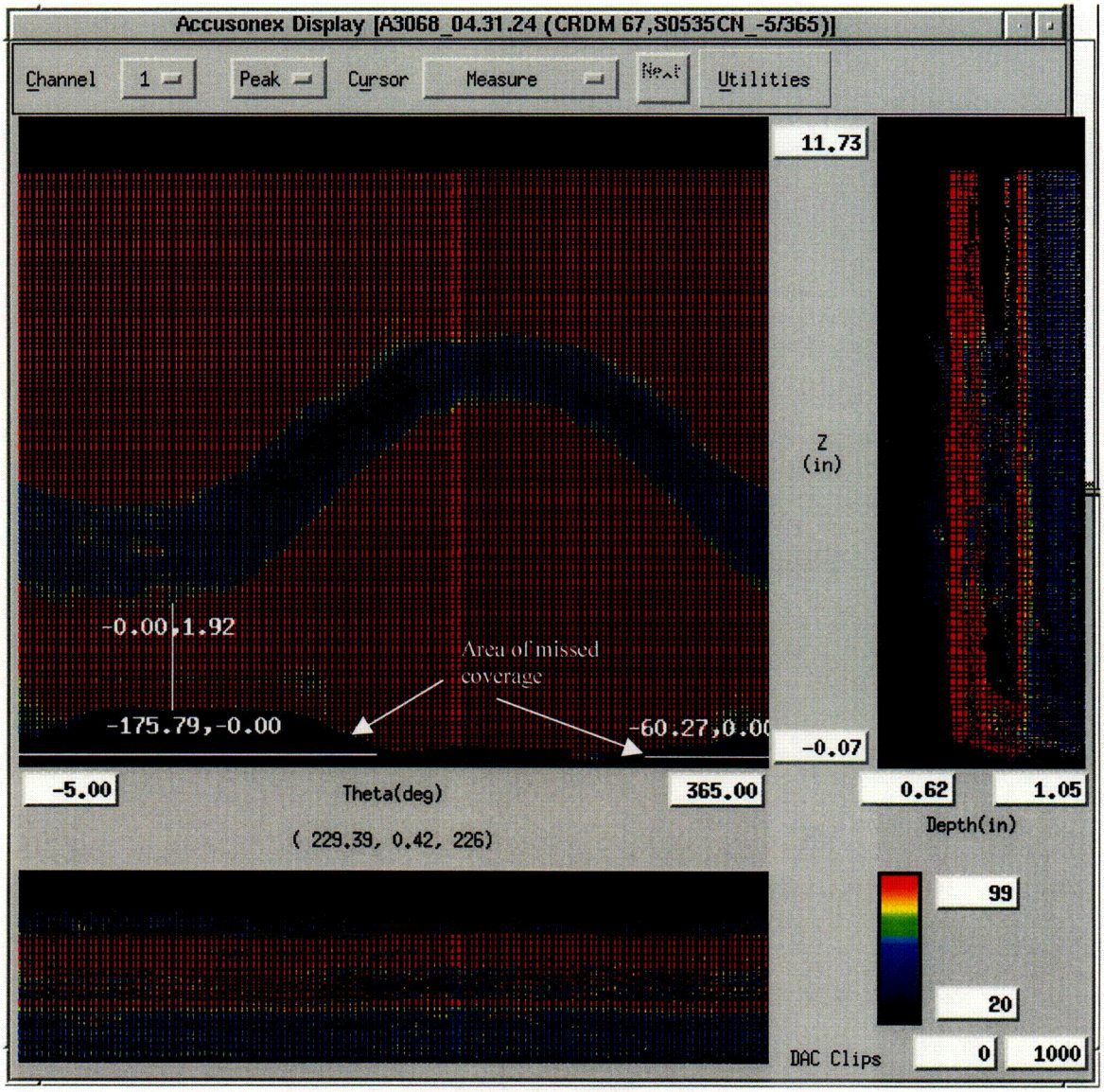

Figure 1: Typical RPV Nozzle UT Inspection "C" Scan with area of missed coverage identified by arrows and above the white horizontal line.

C01

4. PROPOSED ALTERNATIVE AND BASIS FOR USE:

The proposed alternative is to perform the UT examination to the extent practical. This is defined as "the examination shall be performed to include 2 inches above the weld to $\geq$ 1 inch below the weld." This relaxation request documents and submits to the NRC, deviations from the NRC Order required inspection coverage area along with a justification as to their acceptability.

BASIS FOR RELAXATION:

Additional efforts to achieve the Order required examination area (below the weld) will result in a hardship due to unusual difficulty without a compensating increase in the level of quality and safety.

The scope of the examination was to perform a 360° volumetric examination from 2 inches above the J-groove weld down to the bottom of the RPV penetration nozzles. The 66 Turkey Point Unit 3 RPV penetration nozzles are used for a variety of functions and present a variety of examination conditions. The 45 RPV penetration nozzles that are attached to active control rod drive mechanisms (CRDMs) have funnel-ended guide sleeves permanently attached inside the nozzles leaving only a narrow annulus available for inspection. The 6 RPV penetration nozzles attached to part length CRDMs have the threaded guide sleeve permanently retracted and pinned inside the RPV penetration nozzles. The two RPV penetration nozzles modified for the reactor vessel level measurement system (RVLMS) have a guide sleeve installed along with a welded end plate (that required removal for inspection). The other 13 RPV penetration nozzles (8 spares, 4 instrument penetrations, and 1 small bore vent line) are open once the RPV head is removed from the vessel for inspection and require a special centering adapter (except the vent) for scanning with the current UT equipment. These various design conditions, and the normal distortion of the RPV penetration nozzles caused by the welding into the sloped hemispherical head, result in a variety of examination conditions. The UT probes are optimized for these examination conditions, however, not all the conditions can be anticipated. The UT examination technology currently available for the Turkey Point Unit 3 RPV penetration nozzle inspections, has resulted in some areas of missed inspection > 1 inch below the weld. A hardship or unusual difficulty, without a compensating increase in level of quality or safety, would result if physical modifications, such as removal of RPV nozzle penetration sleeves or new UT equipment would have to be developed, to achieve the complete coverage in the non pressure boundary portion of the RPV nozzle material > 1 inch below the weld required by the Order.

To evaluate the significance of the lack of UT inspection coverage, the inspection coverage data was broken into 2 distinct regions. Those regions include the

nozzle base material from 2 inches above the weld to a minimum of 1 inch below the weld, and from > 1 inch below the weld. A summary of these 2 UT coverage areas, and the number of nozzles affected as of March 11, 2003 is provided in Table 1 below. When the remaining 18 penetrations are inspected, evaluated, and the RPV nozzle penetration UT inspection is complete, FPL will supplement this relaxation, if required, by updating Tables 1 and 2 with the final total of nozzles that meet the criteria described above. If examination of any of the remaining nozzles does not meet the criteria identified in the proposed alternative and basis for use in Section 4 above, that nozzle would not be covered under this relaxation request.

Table 1: Summary of Complete and Incomplete Inspection Coverage

Area of UT Coverage	Number of Penetrations Inspected
Complete coverage from 2" above the weld to a minimum of 1" below the weld	48 of 48 completed (18 additional penetrations to be inspected)
Complete coverage from 1" below the weld to the bottom of the nozzle	42 of 48
Incomplete coverage from 1" below the weld to the bottom of the nozzle	6 of 48

A complete matrix of the UT inspection coverage areas, UT inspection results and the "leak path" results is provided in Table 2.

Table 2: Turkey Point Unit 3 UT Data Coverage Matrix for RPV Nozzles

RPV	Turkey Point Unit 3 Cycle 20 - Extent of UT Coverage in RPV Nozzle Material							Leak Path Data	
Pen #	Min. Distance Above Weld Root (Inches)	Coverage Above Weld Root (Theta)	Coverage @ Weld Root (Theta)	Weld Region Coverage (Theta)	Below Weld Coverage (Theta)	Min Distance Below Weld Toe when incomplete coverage (Inches)	Comments	Determination Possible?	Leak Path Results
1	3.10	360	360	360	360	N/A	NRI (No Recordable Indications)	Yes	No Leak Path (LP)
2									
3	3.24	360	360	360	360	N/A	NRI	Yes	No LP
4									
5									
6									
7									
8	3.22	360	360	360	360	N/A	NRI	Yes	No LP
9	3.34	360	360	360	360	N/A	NRI	Yes	No LP
10									
11									
12									
13									
14	3.00	360	360	360	360	N/A	NRI	Yes	No LP
15	3.22	360	360	360	360	N/A	NRI	Yes	No LP
16	3.13	360	360	360	360	1.4	NRI, coverage below weld from 121° - 78°.	Yes	No LP
17	3.19	360	360	360	360	N/A	NRI	Yes	No LP
18	3.30	360	360	360	360	N/A	NRI	Yes	No LP
19	3.33	360	360	360	360	N/A	NRI	Yes	No LP
20									
21									
22	3.00	360	360	360	360	N/A	NRI	Yes	No LP
23									
24									
25	3.23	360	360	360	360	N/A	NRI	Yes	No LP
26	2.60	360	360	360	360	N/A	NRI	Yes	No LP
27	2.60	360	360	360	360	N/A	NRI	Yes	No LP
28	3.14	360	360	360	360	N/A	NRI	Yes	No LP
29	2.89	360	360	360	360	N/A	NRI	Yes	No LP
30	3.29	360	360	360	360	N/A	NRI	Yes	No LP
31	3.10	360	360	360	360	1.1	NRI, coverage below weld from 303° - 360°.	Yes	No LP
32									
33	2.90	360	360	360	360	N/A	NRI	Yes	No LP
34	3.13	360	360	360	360	N/A	NRI	Yes	No LP
35	3.10	360	360	360	360	N/A	NRI	Yes	No LP
36	3.55	360	360	360	360	N/A	NRI	Yes	No LP

37									
38	3.30	360	360	360	360	N/A	NRI	Yes	No LP
39	2.68	360	360	360	360	N/A	NRI	Yes	No LP
40	2.80	360	360	360	360	N/A	NRI	Yes	No LP
41	2.80	360	360	360	360	N/A	NRI	Yes	No LP
42	2.17	360	360	360	360	N/A	NRI	Yes	No LP
43	2.87	360	360	360	360	1.0	NRI, coverage below weld from 328° - 104°.	Yes	No LP
44	2.90	360	360	360	360	N/A	NRI	Yes	No LP
45	3.00	360	360	360	360	N/A	NRI	Yes	No LP
46	2.10	360	360	360	360	N/A	NRI	Yes	No LP
47	2.00	360	360	360	360	N/A	NRI	Yes	No LP
48									
49	2.30	360	360	360	360	N/A	NRI	Yes	No LP
51	2.45	360	360	360	360	N/A	NRI	Yes	No LP
53	2.30	360	360	360	360	N/A	NRI	Yes	No LP
55	2.24	360	360	360	360	N/A	NRI	Yes	No LP
57	2.30	360	360	360	360	N/A	NRI	Yes	No LP
58	3.30	360	360	360	360	N/A	NRI	Yes	No LP
59									
60									
61	4.00	360	360	360	360	N/A	NRI	Yes	No LP
62	3.60	360	360	360	360	N/A	NRI	Yes	No LP
63	2.00	360	360	360	360	1.8	NRI, coverage below weld from 322° - 355°.	Yes	No LP
64	2.38	360	360	360	360	1.5	NRI, coverage below weld from 318° - 49.4°.	Yes	No LP
65	2.68	360	360	360	360	N/A	NRI	Yes	No LP
66	3.00	360	360	360	360	N/A	NRI	Yes	No LP
67	2.98	360	360	360	360	1.9	NRI, coverage below weld from 343° - 170°.	Yes	No LP
68	3.17	360	360	360	360	N/A	NRI	Yes	No LP
69	2.69	360	360	360	360	N/A	NRI	Yes	No LP
Vent	2.00	360	360	360	N/A	N/A	NRI	N/A	N/A

To determine the significance of the lack of UT examination coverage, the effect of a postulated axial and circumferential flaw in the nozzle material was evaluated relative to the areas of examination coverage identified above.

From 2 inches above the weld to 1 inch below the weld: The areas of prime interest because of the safety concern for nozzle ejection and LOCA are circumferential cracks located in the nozzle material at the weld root and above the weld. This is also the area that axial cracks would have to propagate to in order for a leak to occur through the RPV penetration nozzle material. The UT examinations of the RPV penetration nozzles have bounded this area (the safety significant region), by providing complete 360° coverage of the nozzle base material (from 2 inches above the weld to 1 inch below the weld) for all the RPV

nozzle penetrations currently inspected. Therefore, reliable assurance is provided to conclude that safety significant circumferential flaws do not exist at or above the weld root.

Greater than 1 inch below the weld to the bottom of the nozzle: Axial flaws in the area of non-coverage in the non-pressure boundary nozzle base material below the weld are of no structural significance, however, a postulated flaw could grow above the weld to the point of leakage followed by wastage and/or potential initiation of an OD circumferential flaw.

To determine the significance of an axial flaw that is contained in the non-pressure boundary nozzle material in the un-inspected region >1 inch below the weld, a flaw tolerance approach is used. A flaw evaluation was performed postulating an axial flaw in the area of missed coverage below the weld using WCAP-16027-P [3]. A through wall flaw is postulated in the nozzle material from the bottom of the penetration to 1" from the bottom of the weld. The flaw evaluation in WCAP-16027-P is based on Turkey Point Unit 3 and 4 specific stresses in the nozzle penetrations. Since the stresses >1" below the weld are too low to propagate an axial flaw, the WCAP-16027-P flaw evaluations start at ½" below the weld, and evaluate the time to propagate the flaw in the nozzle to the bottom of the weld (start of the pressure boundary portion of the nozzle material or toe of the J-groove weld). Assuming a through wall flaw below the weld, with the flaw end located at ½" below the weld (which is in the area of complete UT examination coverage), an axial flaw would take greater than 5 years of operation (Figures 6-12 through 6-20 in WCAP-16027-P) in any nozzle location to grow to the point of contact with the weld. This time period is significantly greater than the current inspection frequency of every refueling cycle (18 months for Turkey Point Unit 3) identified in NRC Order EA-03-009. As an added conservatism, this evaluation does not attempt to evaluate the time for the axial flaw to grow from the bottom of the weld through the pressure boundary. Figure 2 provides a graphical presentation of the above flaw evaluation discussion for the outer most penetration location.

[3] "Structural Integrity Evaluation of Reactor Vessel Upper Head Penetrations to Support Continued Operation: Turkey Point Units 3 & 4," Westinghouse Electric Co. LLC, WCAP-16027-P Revision 0, Draft, February 2003.

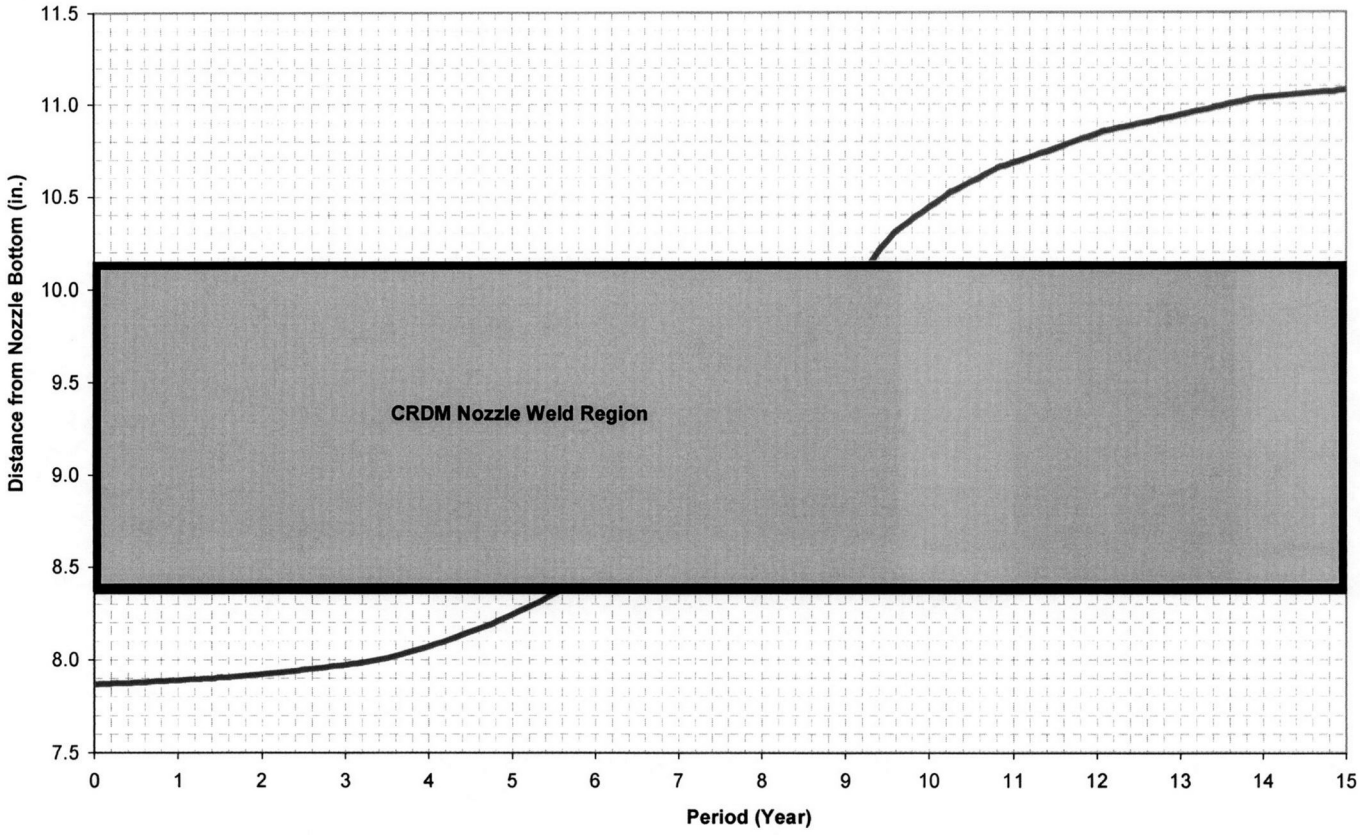

Figure 2: Through-Wall Axial Flaws Located in the 42.6 Degree Row of Penetrations, Uphill Side - Crack Growth Predictions (From Figure 6-19, WCAP-16027-P)

Therefore, there are no concerns with the structural integrity of the RPV penetration nozzles that could be caused by axial cracking in the missed coverage areas in the non-pressure boundary portion of the nozzle material > 1" below the weld for a period of > 5 years of operation.

This conclusion is based on the following results:

- UT inspection results of no indications in the nozzle areas examined from a minimum of 1" below the weld to 2" above the weld (100% coverage obtained)
- Acceptable assessment of no "leak path" present into interference fit zone (100% coverage obtained)
- UT inspection results of no indications in the nozzle areas examined greater than 1" below the weld (coverage per Table 2)

- Acceptable bare metal visual examination results of no leakage or wastage of the RPV head

5. DURATION OF PROPOSED ALTERNATIVE:

This relaxation is applicable to the March 2003 refueling outage for PTN-3. After one operating cycle from the 2003 identified refueling outage, the PTN-3 RPV head will be re-inspected as per the Order, or the RPV head will be replaced.