



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

Ref: 10 CFR 50.55a

April 16, 2009  
3F0409-05

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

Subject: Crystal River Unit 3 – Response to Request for Additional Information Regarding Relief Request #08-001-MX, Revision 0 (TAC NO: ME0227)

- References:
- (1) NRC to Crystal River Unit 3 letter, dated March 5, 2009, "Crystal River Unit 3 – Request for Additional Information Regarding Relief Request 08-001-MX, Revision 0, Inservice Inspection Program for the Fourth 10-Year Interval (TAC NO: ME0227)"
  - (2) Crystal River Unit 3 to NRC letter, 3F1208-04, dated December 10, 2008, "Crystal River Unit 3 – Relief Request (RR) #08-001-MX, Revision 0"

Dear Sir:

Pursuant to 10 CFR 50.55a(a)(3)(i), Florida Power Corporation (FPC), doing business as Progress Energy Florida, Inc., is hereby submitting the Crystal River Unit 3 (CR-3) response to the Nuclear Regulatory Commission (NRC) request for additional information (RAI) received by letter dated March 5, 2009 (Reference 1). This request for additional information is based on the NRC review of CR-3 Relief Request #08-001-MX, Revision 0 (Reference 2).

This correspondence contains no new regulatory commitments.

If you have any questions regarding this submittal, please contact Mr. Dan Westcott, Supervisor, Licensing and Regulatory Programs at (352) 563-4796.

Sincerely,

Stephen J. Cahill  
Engineering Manager

SJC/par

Attachments:

- A. Response to Request for Additional Information
- B. Affected Tendon Surveillance Review

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

Progress Energy Florida, Inc.  
Crystal River Nuclear Plant  
15760 W. Power Line Street  
Crystal River, FL 34428

A0417  
NCR

**PROGRESS ENERGY FLORIDA, INC.**

**CRYSTAL RIVER UNIT 3**

**DOCKET Number 50-302 /License Number DPR-72**

**Attachment A**

**Response to Request for Additional Information**

## Response to Request for Additional Information

### NRC Request #1

*Please provide the required vertical tendon force according to the CR-3 current licensing basis along with the minimum predicted force, expected during the refueling outage R17 in 2011, for the affected vertical tendons.*

### CR-3 Response

The vertical tendon force (at the end of 40 year life) required to maintain the containment qualified for the maximum accident internal pressure is 1149 kips, according to the current CR-3 licensing basis. The minimum predicted force for the population of affected vertical tendons for the surveillance that will be conducted during R17 in 2011 is 1512 kips.

### NRC Request #2

*Based on the information provided in the licensee's letter dated December 10, 2008, 30 vertical tendons will be affected by post-tensioning repair/replacement activities. If any of these 30 vertical tendons or other tendons in close proximity of the affected tendons were selected for inspection during previous tendon surveillances, please provide results of those inspections.*

### CR-3 Response

The table included as Attachment B to this letter contains surveillance results for the 30 vertical tendons that will be affected by post-tensioning repair/replacement activities, and those in close proximity, since plant start-up.

### NRC Request #3

*Please discuss if there have been any indications of water intrusion or corrosion in the vertical tendons.*

### CR-3 Response

Of the eight previous in-service inspections, no evidence of water contamination in any vertical tendon was observed with the exception of one tendon during the 2<sup>nd</sup> surveillance conducted in 1980. Tendon 56V1 was found to have approximately 15 gallons of water. The water was drained and the grease was replaced. The table included in Attachment B provides information on the indications of corrosion in the Tendon/Anchorage Inspection rows. Where warranted, corrosion was removed from the surfaces and additional corrosion protection applied.

In addition to the above, CR-3 refilled (topped off) 120 of the 144 vertical tendon upper grease cans during a non-surveillance inspection in 1999. This was performed as the result of tendon corrosion problems previously identified at the Calvert Cliffs Nuclear Power Plant. No significant corrosion was noted at that time. During the refilling of the vertical tendons, six (6) tendons required the addition of grease in excess of five percent of the net duct volume of the tendon. Special Report 99-01 was submitted to the NRC on March 10, 1999, to document this condition.

Instructions for reading Attachment B are provided below:

The table included in Attachment B is arranged with the relative physical location of the affected tendons shown across the top line. The affected tendons are arranged as if viewing the containment from inside relative to the construction opening location. Tendon numbering is based on the buttresses that they lie between (23, 34, 45) and then by a sequential number increasing from left to right. Buttresses are numbered counterclockwise from number 1, which is aligned with compass North. Tendon 34V1 is the leftmost tendon adjacent to Buttress 4.

The surveillance intervals are listed on the left vertical axis from the earliest on top to the latest at the bottom. X's below the tendon numbers indicate the affected tendons that were inspected during each surveillance interval. Where there were no affected tendons inspected (last two surveillances), notes indicate the nearest tendons inspected.

**PROGRESS ENERGY FLORIDA, INC.**

**CRYSTAL RIVER UNIT 3**

**DOCKET Number 50-302 /License Number DPR-72**

**Attachment B**

**Affected Tendon Surveillance Review**

		Detension / Retension Tendons										Tendon Replacements										Detension / Retension Tendons															
		45V22	45V23	45V24	34V1	34V2	34V3	34V4	34V5	34V6	34V7	34V8	34V9	34V10	34V11	34V12	34V13	34V14	34V15	34V16	34V17	34V18	34V19	34V20	34V21	34V22	34V23	34V24	23V1	23V2	23V3						
1st Surv.	11/28/77 - 02/09/78								X																												
VSL Corp.	Water Results	All	No evidence of water contamination found in any end cap of the twenty-one surveillance tendons (Horizontal & Vertical).																																		
	Lift-Off test	34V6	Previous Force - 1615 Kips, Anticipated Force - 1499.6 Kips, As-Found Force - 1590 Kips																																		
	Tendon Insp.	34V6	No broken, damaged, or missing wires. 2 cracked Button heads. Corrosion Category: 1 (Button Head, Stressing Washer, Bearing Plate)																																		
	Anchorage Insp.	34V6	Top - No cracking, Bottom - Hairline crack < 0.003", minor corrosion on stressing washer.																																		
		45V22	45V23	45V24	34V1	34V2	34V3	34V4	34V5	34V6	34V7	34V8	34V9	34V10	34V11	34V12	34V13	34V14	34V15	34V16	34V17	34V18	34V19	34V20	34V21	34V22	34V23	34V24	23V1	23V2	23V3						
2nd Surv.	03/05/80 - 05/09/80				X																																
VSL Corp.	Water Results	56V1	Approximately 15 gallons of water was found in Tendon 56V1, grease was drained and replaced. No other evidence of water contamination was found on the other twenty-one tendons.																																		
	Lift-Off test	34V1	Lift-Off Only: As-Found 1569 Kips																																		
	Tendon Insp.	34V1	No broken, damaged, or missing wires. No cracked button heads. Corrosion category: 1 (Button Head, Stressing Washer, Bearing Plate)																																		
	Anchorage Insp.	34V1	No cracking either end.																																		
		45V22	45V23	45V24	34V1	34V2	34V3	34V4	34V5	34V6	34V7	34V8	34V9	34V10	34V11	34V12	34V13	34V14	34V15	34V16	34V17	34V18	34V19	34V20	34V21	34V22	34V23	34V24	23V1	23V2	23V3						
3rd Surv.	09/28/81 - 12/07/81								X														X														
VSL Corp.	Note:	The VSL data for the 3rd Surveillance could not be located in a timely manner. An evaluation of Lift-Off Forces report by Gilbert Associates, Inc. was obtained and provided some data on the 3rd Surveillance (see below)																																			
	Lift-Off test	34V6	Lift-Off reported as 1600 Kips on Gilbert Associates, Inc. 3rd Surveillance Lift-Off Evaluation Report																																		
	Lift-Off test	34V19	Lift-Off reported as 1640 Kips on Gilbert Associates, Inc. 3rd Surveillance Lift-Off Evaluation Report																																		
		45V22	45V23	45V24	34V1	34V2	34V3	34V4	34V5	34V6	34V7	34V8	34V9	34V10	34V11	34V12	34V13	34V14	34V15	34V16	34V17	34V18	34V19	34V20	34V21	34V22	34V23	34V24	23V1	23V2	23V3						
4th Surv.	Oct - Nov. 1987						X																														
VSL Corp.	Water Results	All	No evidence of water contamination found in any end cap of the eleven tendons (Horizontal & Vertical).																																		
	Lift-Off test	34V4	As-Found Force - 1623 Kips, allowables 1721 Kips (Max. ), 1249 Kips (Min. )																																		
	Tendon Insp.	34V4	No broken, damaged, or missing wires or buttonheads.																																		
	Anchorage Insp.	34V4	No cracking either end. Corrosion category: Field End - Shim 1, Anchorhead 1, Bearing Plate 1, Buttonhead 1. Shop End - Shim 2, Anchorhead 2, Bearing Plate 4 (pitting >0.003" - < 0.006"), Buttonhead 1																																		
		45V22	45V23	45V24	34V1	34V2	34V3	34V4	34V5	34V6	34V7	34V8	34V9	34V10	34V11	34V12	34V13	34V14	34V15	34V16	34V17	34V18	34V19	34V20	34V21	34V22	34V23	34V24	23V1	23V2	23V3						
5th Surv.	Nov. 93 - Jan. 94								X																												
VSL Corp.	Water Results	All	No evidence of water contamination found in any end cap of the fourteen tendons (Horizontal & Vertical).																																		
	Lift-Off test	34V6	As-Found Force - 1590 Kips, allowables: 1721 Kips (Max.), 1249 Kips (Min. )																																		
	Tendon Insp.	34V6	No broken, damaged, or missing wires or buttonheads.																																		
	Anchorage Insp.	34V6	No cracking either end. Corrosion category: Field End - Shim 2, Anchorhead 2, Bearing Plate 2, Buttonhead 1. Shop End - Shim 2, Anchorhead 2, Bearing Plate 2, Buttonhead 1																																		
		45V22	45V23	45V24	34V1	34V2	34V3	34V4	34V5	34V6	34V7	34V8	34V9	34V10	34V11	34V12	34V13	34V14	34V15	34V16	34V17	34V18	34V19	34V20	34V21	34V22	34V23	34V24	23V1	23V2	23V3						
6th Surv.	10/20/97 - 1/16/98						X																							X							
PSC Corp.	Water Results	All	No evidence of water contamination found in any end cap of the nineteen tendons (Horizontal & Vertical), except a few drops noted in the 51H25 Field end.																																		
	Lift-Off test	23V2	As-Found 1609 Kips, Base (Predicted) value 1482 Kips																																		
	Tendon Insp.	23V2	No broken, damaged, or missing wires or buttonheads noted.																																		
	Tendon Insp.	34V4	No broken, damaged, or missing wires or buttonheads noted.																																		
	Anchorage Insp.	23V2	No cracks noted. Corrosion category: Both Ends - Shim 2, Anchorhead 2, Bearing Plate 2, Buttonhead 1.																																		
		45V22	45V23	45V24	34V1	34V2	34V3	34V4	34V5	34V6	34V7	34V8	34V9	34V10	34V11	34V12	34V13	34V14	34V15	34V16	34V17	34V18	34V19	34V20	34V21	34V22	34V23	34V24	23V1	23V2	23V3						
N/A Surv.	Feb. 1999	CR3 refilled (topped off) 120 of the 144 Vertical Tendon Upper Grease cans.																																			
		45V22	45V23	45V24	34V1	34V2	34V3	34V4	34V5	34V6	34V7	34V8	34V9	34V10	34V11	34V12	34V13	34V14	34V15	34V16	34V17	34V18	34V19	34V20	34V21	34V22	34V23	34V24	23V1	23V2	23V3						
7th Surv.	Aug. - Dec. 2001	(No tendons were inspected during the 7th surveillance that fall within the affected area. The nearest tendon was 45V14)																																			
PSC Corp.	Water Results	All	No evidence of water contamination found in any end cap of the twenty-four tendons (Horizontal & Vertical).																																		
	Lift-Off test	45V14	(Close proximity) As-Found 1552 Kips, Base (Predicted) value 1580 Kips																																		
	Tendon Insp.	45V14	No broken, damaged, or missing wires or buttonheads. One wire removed and tested satisfactorily.																																		
	Anchorage Insp.	45V14	No cracks noted. Corrosion category: Shim 1 (shop end) 2 (field end), Anchorhead 1 (both ends), Bearing Plate 5 [heavy rusting and noticable pitting](shop end) 2 (field end), Buttonhead 1 (both ends).																																		
		45V22	45V23	45V24	34V1	34V2	34V3	34V4	34V5	34V6	34V7	34V8	34V9	34V10	34V11	34V12	34V13	34V14	34V15	34V16	34V17	34V18	34V19	34V20	34V21	34V22	34V23	34V24	23V1	23V2	23V3						
8th Surv.	10/08/07 - 12/07/07	(No tendons were inspected during the 8th surveillance that fall within the affected area. The nearest tendon was 45V20)																																			
PSC Corp.	Water Results	All	No evidence of water contamination found in any end cap of the twenty-seven tendons (Horizontal & Vertical).																																		
	Lift-Off test	45V20	(Close proximity) As-Found 1456.8 Kips, Base (Predicted) value 1507 Kips																																		
	Tendon Insp.	45V20	No broken, damaged, or missing wires or buttonheads noted.																																		
	Anchorage Insp.	45V20	No cracks noted. Corrosion category: Both Ends - Shim 2, Anchorhead 2, Bearing Plate 2, Buttonhead 2 (top) 1 (bottom).																																		

**Corrosion Categories**

1. Bright metal; no visible oxidation.
2. Metal reddish brown color, no pitting.
3. Metal having patches of red oxide, removable but ready to start pitting.
4. Metal having patches of red oxide, not removable and/or leaving noticeable pits.
5. Metal having heavy rusting, dark red and about to form an extremely hard crust which when removed leaves very noticeable pitting.