Progress Energy

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

Ref: 10 CFR 50.90

September 1, 2011
3F0911-01

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

Subject: Crystal River Unit 3 – License Amendment Request #310, Revision 1 Departure from a Method of Evaluation for the Auxiliary Building Overhead Crane - Response to Request for Additional Information (TAC No. ME5208)

References:
1. NRC to CR-3 email dated August 18, 2011, "Follow up RAIs regarding LAR310, Departure From A Method Of Evaluation For The Auxiliary Building Overhead Crane And Revisions To Associated Commitments (TAC No. ME5208)"
2. Crystal River Unit 3 to NRC Letter dated July 20, 2011, "Crystal River Unit-3 – License Amendment Request #310, Revision 1 Departure from a Method of Evaluation for the Auxiliary Building Overhead Crane, Revisions to Associated Commitments, and Response to Request for Additional Information (TAC No. ME5208)"

Dear Sir:

Pursuant to 10 CFR 50.90, Florida Power Corporation (FPC), doing business as Progress Energy Florida, Inc. (PEF), hereby provides the responses to a Request for Additional Information forwarded by Reference 1. Responses to the Request for Additional Information are contained in the attachment to this letter.

This response contains no new regulatory commitments.

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

Sincerely,

Jon A. Franke
Vice President
Crystal River Nuclear Plant

JAF/scp

Attachment: Response to Request for Additional Information

Enclosure: CD-ROM of Auxiliary Building Design Criteria Document and Calculations

cc: NRR Project Manager
Regional Administrator, Region II
Senior Resident Inspector
State Contact

A001
NRR

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

STATE OF FLORIDA

COUNTY OF CITRUS

Jon A. Franke states that he is the Vice-President, Crystal River Nuclear Plant for Florida Power Corporation, doing business as Progress Energy Florida, Inc.; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission the information attached hereto; and that all such statements made and matters set forth therein are true and correct to the best of his knowledge, information, and belief.

Jon A. Franke
Vice President
Crystal River Nuclear Plant

The foregoing document was acknowledged before me this 1 day of September, 2011, by Jon A. Franke.

Carolyn E. Portmann
Signature of Notary Public
State of Florida

CAROLYN E. PORTMANN
Commission # DD 937553
Expires March 1, 2014
Bonded Thru Troy Fain Insurance 800-385-7019

(Print, type, or stamp Commissioned
Name of Notary Public)

Personally Known ✓ -OR- Produced Identification _____

PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50-302/LICENSE NUMBER DPR-72

LICENSE AMENDMENT REQUEST #310, REVISION 1

ATTACHMENT

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

By letter dated December 20, 2010, as superseded by letter dated July 20, 2011, Florida Power Corporation submitted Crystal River Unit 3 (CR-3) – License Amendment Request (LAR) # 310, Revision 1, "Departure from a Method of Evaluation for the Auxiliary Building Overhead Crane, Revisions to Associated Commitments, and Response to Request for Additional Information." On August 18, 2011, the NRC emailed a request to CR-3 for additional information needed in order to complete their technical review. Responses are provided below.

A CD-ROM, enclosed with this correspondence, contains the drawings and other documents referenced in these responses.

RAI-1:

In Enclosure B of the CD-ROM, with regards to the Auxiliary Building modification drawings and the installation instruction (EC 70139), the licensee provided drawing 522-041-010 for the existing refueling floor – Elevation 162'-0" from Column S1 to Column L. However, the staff noted that Columns L to I1 are missing. Please provide the missing sections of the drawing for the staff to review.

CR-3 Response:

Columns in rows K to I1 locations are shown in Drawing 521-142-003, which is Attachment Z109 R0 in EC 70139.

RAI-2:

Also on drawing # 522-041-018, please address what the elevation is for this plant view. For Columns 302A & N1, 302A & P1, 302A &Q1, 301 & N1, and 301 & S1, please address the locations and the condition of those columns base plate for the staff to review.

CR-3 Response:

The Elevation shown in Drawing 522-041-018, which is Attachment Z93 R0 in EC 70139, is at 143'-0" except for Columns in Row S1, which are at Elevation 119'-0". The location and condition of all the column bases are shown on Page 19 of Calculation S09-0036. In Table 4 on page 19, dash entries denote that column bases are fixed in that direction.

RAI-3:

In accordance with NOG-1-2004, Section 4153.6, "Boundary Conditions at Trolley and Runway Rails," please provide a summary of the results of your analysis, along with the modification drawings.

CR-3 Response:

The boundary conditions at Trolley and Runway Rails are as per NOG-1-2004 and they are shown in Design Criteria Document FPC118-PR-001, "Design Criteria Document for Crystal River Unit 3 Auxiliary Building Evaluation for Crane Upgrade," Pages 16 and 17. The boundary conditions are also shown in Calculation S09-0036, Page 24. These boundary conditions, along with other design inputs included in FPC118-PR-001, serve as the guidelines for the Auxiliary Building (AB) structural analysis.

There were three primary calculations used in the analysis of the structure. The first calculation is S09-0036, "Auxiliary Building Overhead Crane (FHCR-5) Supporting Steel Structure – Analysis." Calculation S09-0036 includes a GTSTRUDL model of the structure and analyzes the stresses in the structural members. This calculation determines members that require replacement for increased strength due to increased loading. Calculation S09-0036 is used as input to calculation S10-0063, "Auxiliary Building Overhead Crane (FHCR-5) Supporting Steel Structure – Connection Evaluation." Calculation S10-0063 analyzes connections and determines connection modifications that are required for the revised loads. The GTSTRUDL calculation (S09-0036) uses load cases from NOG-1-2004, which match the load cases listed in the LAR.

A third calculation, S10-0049, "Auxiliary Building Overhead Crane (FHCR-5) Supporting Steel Structure – ANSYS Model," is an ANSYS model of the AB, which includes the stick model of the crane (supplied by the crane vendor). This calculation is not used for qualification of the AB crane support structure. This calculation is generated for use by the crane manufacturer, and has been verified to match the GTSTRUDL calculation. The GTSTRUDL model was converted to an ANSYS model by the AB upgrade architect/engineer (A/E), as that is the software the crane vendor uses in the analysis. The ANSYS model of the AB structure (with a stick model of the crane) was sent from the A/E to the crane vendor for use in a coupled analysis of the crane and support structure.

The table below, taken from EC 70139 and provided as Table 3 in the CR-3 Response to RAI-4 (Reference 2), summarizes the required modifications to the AB based on the results of the analyses described above. In this version of the table, the drawing numbers have been reformatted to agree with the numbering found in the enclosed CD-ROM.

Summary of Required Modifications to the Auxiliary Building

Type of Modification	Total No.	Drawings
Vertical Bracing Member Replacement	9	522-041-001 *(Attachment Z107)* 522-006 *(Attachment Z103)*
Vertical Bracing Connections	51	522-041-001 thru -009, -024 *(Attachment Z107, Z108, Z45, Z46, Z47, Z48, Z49, Z50, Z51, and Z122)* 522-006 *(Attachment Z103)*
Horizontal Bracing Connections at Roof EL. 209'-1" (between column line I1 & J1)	2	521-142-001 *(Attachment Z100)* 521-102 *(Attachment Z96)*
E-W Member Connections at Roof EL. 209'-1" (at column line S1)	2	522-041-014 *(Attachment Z73)* 522-004 *(Attachment Z102)*
N-S Member Connections at Roof EL. 209'-1" (between column line P1 & Q1)	2	522-041-001 & -004 *(Attachment Z107 and Z46)* 522-004 *(Attachment Z102)*
N-S Member Connections (Purlin) at Roof EL. 209'-1"	98	521-142-001 *(Attachment Z100)* 522-041-015 *(Attachment Z91)* 521-102 *(Attachment Z96)* 522-004 *(Attachment Z102)*
E-W Member Connections at EL. 189'-9" (at column line S1)	3	522-041-001 & -017 *(Attachment Z107 & Z104)* 522-004 *(Attachment Z102)*
Horizontal Bracing Connections at Floor EL. 162'-0" (between column line N1 & O1)	1	522-041-010 & -015 *(Attachment Z52 & Z91)* 522-003 *(Attachment Z101)*

Type of Modification	Total No.	Drawings
E-W Member Moment Connections at Floor EL. 162'-0"	8	522-041-010, -012, -013, -020, -023 *(Attachment Z52, Z70, Z72, Z106, Z121)* 522-003 *(Attachment Z101)*
E-W Member Connections at EL. 162'-0" (at column line L, at column line S1, and between column line M1 & N1)	5	522-041-010 & -016 *(Attachment Z52 & Z92)* 522-003 *(Attachment Z101)*
N-S Member Connections at EL. 162'-0"	32	522-041-010,-014,-015,-016 *(Attachment Z52, Z73, Z91, Z92)* 522-003 *(Attachment Z101)*
Miscellaneous N-S Member Connections	8	522-041-001,-010,-017 *(Attachment Z107, Z52, & Z104)* 522-003 *(Attachment Z101)*
Crane Girder Bracket Connections	15	521-142-002, -005, -006 *(Attachment Z105, Z117, Z118)* 522-041-011, -021, -022 *(Attachment Z53, Z111, Z120)* 521-102 *(Attachment Z96)* 522-004 *(Attachment Z102)*
Column Connections to Concrete Floor	13	521-142-003 & -004 *(Attachment Z109 & Z110)* 522-041-018 & -019 *(Attachment Z93 & Z95)*
Concrete Tie Beam between 301-S_1 and 302A-S_1 Concrete Column Pier	1	422-057 *(Attachment Z119)*

RAI-4:

Please indicate which steel building columns are anchored to the concrete structure at the 143 and 162 foot elevations. Also, please address which columns were anchored at the 119 foot elevation for the cask loading bay.

CR-3 Response:

The location and boundary conditions for all the column bases are listed on Page 19 of calculation S09-0036. To summarize, column bases for 301-L, 302A-L, 301-M1, 302A-M1, 301-N1, 302A-N1, 301-O1, 302A-O1, 301-P1, 302A-P1, 301-Q1, 302A-Q1, 302A-N2, 301A-N1, 301A-O1, 301A-P1, and 301A-Q1 are located at Elevation 143'-0". Column bases for 301-I1, 302A-I1, 301-J1, 302A-J1, 301-K, and 301A-I1 are located at Elevation 162'-0". Columns 301-S1 and 302A-S1 are anchored at Elevation 119'-0". Refer to Figure 8.1, "3D View of Auxiliary Building with One Crane Location Case," in calculation S09-0036 for a three dimensional representation of the structure.