



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

Ref: 10CFR50.90

April 08, 2009
3F0409-04

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

Subject: Crystal River Unit 3 – License Amendment Request #303, Revision 1: Revision to Final Safety Analysis Report Sections 5.4.3, “Structural Design Criteria,” and 5.4.5.3, “Missile Analysis” - Response to Request for Additional Information

Reference: Crystal River Unit 3 to NRC Letter dated June 3, 2008, “Crystal River Unit 3 – License Amendment Request #303, Revision 0: Revision to Final Safety Analysis Report Sections 5.4.3, “Structural Design Criteria,” and 5.4.5.3, “Missile Analysis” (TAC NO. MD8919)

Dear Sir:

Florida Power Corporation (FPC), doing business as Progress Energy Florida, Inc., in accordance with 10 CFR 50.90, hereby provides a response to a request for additional information (RAI) related to License Amendment Request (LAR) #303, Revision 0. The RAI was received by electronic mail on March 19, 2009. This RAI response also provides a revision to LAR #303, as the Final Safety Analysis Report pages are being revised. This submittal supersedes the referenced letter in its entirety.

The amendment would change the methodology used to qualify the east wall of the Auxiliary Building. The current methodology used the methods in American Concrete Institute (ACI) standard 318-63, “Building Code Requirements for Reinforced Concrete,” June 1963. The proposed methodology is based on ACI 349-97, “Code Requirements for Nuclear Safety Related Concrete Structures,” as endorsed by the Standard Review Plan (NUREG 0800, Revision 2 – March 2007), Section 3.8.4, “Other Seismic Category 1 Structures.”

This License Amendment Request is being submitted per the requirements of 10 CFR 50.59, “Changes, Tests and Experiments,” as this change was determined to require prior NRC approval.

FPC is providing, in accordance with 10 CFR 50.91, a copy of the proposed License Amendment and RAI response to the designated representative for the State of Florida.

The Crystal River Unit 3 Plant Nuclear Safety Committee has reviewed this request and recommended it for approval.

This correspondence contains no new regulatory commitments.

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

A001
NRK

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

Sincerely,



Dale E. Young
Vice President CR-3

DEY/par

Attachment(s):

- A. Response to Request for Additional Information
- B. Calculation S07-0037, Revision 1
- C. Description of Proposed Change, Background, Technical Analysis, Determination of No Significant Hazards Considerations, and the Environmental Assessment
- D. Proposed Revised Final Safety Analysis Report Pages – Strikeout and Shadowed Text Format
- E. Proposed Revised Final Safety Analysis Report pages – Revision Bar Format

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

STATE OF FLORIDA

COUNTY OF CITRUS

Dale E. Young 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.

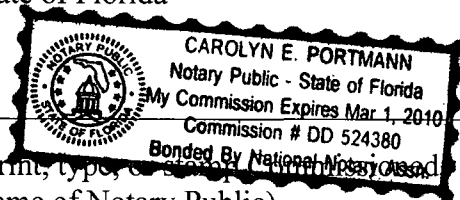
Dale E. Young

Dale E. Young
Vice President
Crystal River Nuclear Plant

The foregoing document was acknowledged before me this 14th day of April, 2009, by Dale E. Young.

Carolyn E. Portmann

Signature of Notary Public
State of Florida



(Print, type, or stamp
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 #303, Revision 1

Revision to Final Safety Analysis Report Sections 5.4.3, “Structural Design Criteria,” and 5.4.5.3, “Missile Analysis”

Attachment A

Response to Request for Additional Information

Response to Request for Additional Information

Based on a telephone conference call between the NRC Staff and Crystal River Unit 3 (CR-3) personnel held on March 10, 2009, and an electronic mail transmission received on March 19, 2009, the following Request for Additional Information were provided to CR-3.

NRC Request:

The license amendment request #303 submitted by Florida Power Corporation (the licensee), by letter 3F0608-06, dated June 3, 2008, for Crystal River Unit 3 (CR-3) stated that the east wall of the CR-3 Auxiliary Building could not be qualified to the code of record, ACI 318-63 "Building Code Requirements for Reinforced Concrete," for all the design basis loads and load combinations as described in the Final Safety Analysis Report (FSAR). Therefore, consistent with Nuclear Regulatory Commission review guidelines in the Standard Review Plan (NUREG-0800, Revision 2 – March 2007), Section 3.8.4, "Other Seismic Category 1 Structures," the licensee is requested to demonstrate that the east wall of the CR-3 Auxiliary Building meets the requirements of ACI 349-97, "Code Requirements for Nuclear Safety Related Concrete Structures," as endorsed, and supplemented by regulatory positions, in Revision 2 (November 2001) of Regulatory Guide (RG) 1.142, "Safety-Related Concrete Structures for Nuclear Power Plants (Other than Reactor Vessels and Containments)" for all the design basis loads and load combinations as described in the FSAR. Accordingly, please address how the east wall of the CR-3 Auxiliary Building meets the requirements of ACI 349-97 and provide appropriate supporting evaluations and justifications.

CR-3 Response:

The expressed concern with the qualification methodology used in License Amendment Request #303, Revision 0, is that the reinforcement in the east wall of the Auxiliary Building is below an acceptable value. Appendix C of ACI 349-97 does not specify any requirements for minimum reinforcement. Therefore ACI 349-97, Section 10.5.3, is applied for the minimum reinforcement of flexural members which references Section 7.12 for structural slabs of uniform thickness. Section 7.12.5 requires that the ratio of reinforcement area provided at the tension face to gross area of concrete not be less than 0.0018 unless the area of reinforcement provided is at least one-third greater than that required by analysis. The ratio provided in the CR-3 Auxiliary Building east wall is 0.0015. In order to satisfy Section 7.12.5 for a lower ratio of reinforcement, the requirements of Appendix C have been checked for a wall with a reduced area of reinforcement which is three-quarters of the actual reinforcement area in the east wall.

Section C.3.3 of ACI 349-97 requires that the permissible ductility ratio be taken as 10 when the area of steel tension reinforcement equals the area of compression reinforcement and flexure controls design. Shear capacity of the east wall has been checked to ensure that the wall meets the requirement of Section C.3.6 for flexure to control the design.

The governing loads for the Auxiliary Building east wall are the tornado wind plus depressurization and the tornado missile. The tornado wind plus depressurization load is qualified against the ultimate moment strength of the wall with reduced reinforcement area. The tornado missile loading is governed by the one ton automobile which is described in Section 5.2.1.2.6 of the FSAR.

For the tornado missile case, the collapse load used to calculate ductility demand was determined by using a circular fan yield pattern based on the Yield Line Theory methodology. This analysis assumes fixed boundary conditions at the ends of the wall panel. The two-foot thick wall is bounded by three-foot thick slabs on the top and bottom, and three-foot wide by four-foot deep columns on each side. These members provide enough rigidity to assume fixed boundary conditions. The columns have also been checked to withstand the missile impact loads.

Per ACI 349-97, Section 7.12.5, the ratio of reinforcement area provided at the tension face to the gross area of concrete can be less than 0.0018, provided other criteria within ACI 349-97 are satisfied. In this case, the existing ratio of 0.0015 should be considered acceptable for the use of the Yield Line Theory methodology and ACI 349-97 to exhibit that the CR-3 Auxiliary Building east wall will not fail under any of the design basis loads and load combinations defined in the CR-3 Final Safety Analysis Report.