



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 16, 2012

Mr. Jon A. Franke
Vice President
Crystal River Nuclear Plant (NA2C)
ATTN: Supervisor, Licensing and
Regulatory Programs (NA1B)
15760 W. Power Line Street
Crystal River, FL 34428-6708

SUBJECT: CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT – REQUEST FOR
ADDITIONAL INFORMATION FOR EXTENDED POWER UPRATE LICENSE
AMENDMENT REQUEST (TAC NO. ME6527)

Dear Mr. Franke:

By letter dated June 15, 2011, as supplemented by letters dated July 5, 2011, August 11, 2011 (two letters), August 18, 2011, August 25, 2011, October 11, 2011, October 25, 2011, December 15, 2011 (two letters), December 21, 2011, January 5, 2012 (two letters), January 19, 2012 (two letters), January 31, 2012, March 19, 2012, March 22, 2012, April 4, 2012 (two letters), April 12, 2012, April 16, 2012, April 26, 2012, June 18, 2012, June 29, 2012, and July 17, 2012 (two letters), Florida Power Corporation, doing business as Progress Energy Florida, Inc., submitted a license amendment request for an extended power uprate to increase thermal power level from 2609 megawatts thermal (MWt) to 3014 MWt for Crystal River Unit 3 Nuclear Generating Plant.

The U.S. Nuclear Regulatory Commission staff is reviewing the submittal and has determined that additional information is required to complete its evaluation. This request was discussed with Mr. Dan Westcott of your staff on August 14, 2012, and it was agreed that a response to the enclosed request for additional information would be provided within 45 days from the date of this letter.

If you have any questions regarding this matter, I can be reached at 301-415-1564.

Sincerely,

A handwritten signature in black ink that reads "Siva P. Lingam".

Siva P. Lingam, Project Manager
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-302

Enclosure:
Request for Additional Information

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION
REGARDING EXTENDED POWER UPRATE TO INCREASE THERMAL POWER LEVEL
FROM 2609 MEGAWATTS THERMAL TO 3014 MEGAWATTS THERMAL
CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT
DOCKET NO. 50-302

By letter dated June 15, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML112070659), as supplemented by letters dated July 5, 2011, August 11, 2011 (two letters), August 18, 2011, August 25, 2011, October 11, 2011, October 25, 2011, December 15, 2011 (two letters), December 21, 2011, January 5, 2012 (two letters), January 19, 2012 (two letters), January 31, 2012, March 19, 2012, March 22, 2012, April 4, 2012 (two letters), April 12, 2012, April 16, 2012, April 26, 2012, June 18, 2012, June 29, 2012, and July 17, 2012 (two letters) (ADAMS Accession Nos. ML112010674, ML11228A032, ML11234A051, ML11234A427, ML11242A140, ML112860156, ML113040176, ML11354A232, ML11354A233, ML11361A460, ML12011A035, ML12030A582, ML12024A300, ML12024A301, ML12032A280, ML12081A293, ML12086A107, ML120970114, ML12097A246, ML12107A216, ML12114A002, ML12118A498, ML12173A391, ML122060421, ML12205A268, and ML12205A452, respectively), Florida Power Corporation (the licensee), doing business as Progress Energy Florida, Inc., submitted a license amendment request for an extended power uprate (EPU) to increase thermal power level from 2609 megawatts thermal (MWt) to 3014 MWt for Crystal River Unit 3 Nuclear Generating Plant (Crystal River 3 or CR-3). Portions of the letters dated June 15, 2011, July 5, 2011, August 11, 2011 (two letters), January 31, 2012, June 18, 2012, and July 17, 2012 (one letter), contain sensitive unclassified non-safeguards information and, accordingly, those portions have been withheld from public disclosure. In order to complete its review of the above documents, the U.S. Nuclear Regulatory Commission (NRC) staff requests additional information originating from its Vessels and Internals Integrity Branch (EVIB):

EVIB REQUEST FOR ADDITIONAL INFORMATION

EVIB-1

Pressure-Temperature (P-T) Limit Curves:

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix G, Section IV.A, "Pressure-Temperature Limits and Minimum Temperature Requirements," indicates that the pressure-retaining components of the reactor coolant pressure boundary (RCPB) that are made of ferritic materials must meet the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section III, supplemented by the additional requirements set forth in 10 CFR 50, Appendix G, Section IV.A.2. Therefore, 10 CFR 50, Appendix G requires that P-T limits be developed for the ferritic materials in the reactor vessel (RV) beltline (neutron fluence $\geq 1 \times 10^{17}$ neutrons/square centimeter (n/cm²), Energy (E) > 1 mega electron volt (MeV)), as well as ferritic materials not in the RV beltline

Enclosure

(neutron fluence $< 1 \times 10^{17}$ n/cm², E > 1 MeV). Further, 10 CFR Part 50, Appendix G requires that all RCPB components must meet the ASME Code, Section III requirements. The relevant ASME Code requirement that will affect the P-T limits is the lowest service temperature requirement for all RCPB components specified in Section III, Paragraph NB-2332(b).

The P-T limit calculations for ferritic RCPB components that are not RV beltline shell materials may define P-T curves that are more limiting than those calculated for the RV beltline shell materials due to the following factors:

1. RV nozzles, penetrations, and other discontinuities have complex geometries that may exhibit significantly higher stresses than those for the RV beltline shell region. These higher stresses can potentially result in more restrictive P-T limits, even if the reference temperature (RT_{NDT}) for these components is not as high as that of RV beltline shell materials that have simpler geometries.
2. Ferritic RCPB components that are not part of the RV may have initial RT_{NDT} values, which may define a more restrictive lowest operating temperature in the P-T limits than those for the RV beltline shell materials.

Based on the above, please describe how the current P-T limit curves at 27.5 effective full power years for CR-3, and the methodology used to develop these curves, considered all RV materials (beltline and non-beltline) and the lowest service temperature of all ferritic RCPB materials, consistent with the requirements of 10 CFR Part 50, Appendix G in the EPU application.

EVIB-2

RV Internals:

CR-3 participated in the industry effort for providing inspection and evaluation guidelines for plants to ensure integrity of RV internals. The product of this industry effort is the Electrical Power Research Institute's technical report, "Materials Reliability Program (MRP-227-A): Pressurized Water Reactor [PWR] Internals Inspection and Evaluation Guidelines," December 2011 (ADAMS Accession No. ML120170453). Sections 7.2 and 7.3 of the MRP 227-A have specified requirements related to RV internals to be executed during the current 40-year license:

- (1) MRP-227-A Section 7.2, "Aging Management Program Requirement," requires, "Each commercial U.S. PWR unit shall develop and document a program for management of aging of reactor internal components within thirty-six months following issuance of MRP-227-Rev. 0 (that is, no later than December 31, 2011)."

Please confirm that you have met this MRP-227-Rev. 0 requirement by the date specified in the parentheses to support the CR-3 EPU application.

- (2) MRP-227-A Section 7.3, "Reactor Internals Guidelines Implementation Requirement," requires, "Implementation of these guidelines [MRP-227-A, Tables 4-1 through 4-9 and Tables 5-1 through 5-3] is to take effect 24 months following issuance of MRP-227-A (that is, no later than December 31, 2013). Implementation means performance of inspections of applicable components within the time frame specified in the guidance provided in the applicable tables."

Please confirm that you will meet the above MRP-227-A requirement by the date specified in the parentheses to support the CR-3 EPU application.

Mr. Jon A. Franke
 Vice President
 Crystal River Nuclear Plant (NA2C)
 ATTN: Supervisor, Licensing and
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Sincerely,

/ RA /

Siva P. Lingam, Project Manager
 Plant Licensing Branch II-2
 Division of Operating Reactor Licensing
 Office of Nuclear Reactor Regulation

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