



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

Ref: 10 CFR 54

April 26, 2011  
3F0411-05

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

Subject: Crystal River Unit 3 – Response to Request for Additional Information for the Review of the Crystal River Unit 3, Nuclear Generating Plant, License Renewal Application (TAC NO. ME0274) and Amendment #20

- References:
- (1) CR-3 to NRC letter, 3F1208-01, dated December 16, 2008, "Crystal River Unit 3 – Application for Renewal of Operating License"
  - (2) NRC to CR-3 letter, dated March 31, 2011, "Request for Additional Information for the Review of the Crystal River Unit 3 Nuclear Generating Plant, License Renewal Application (TAC NO. ME0274)"

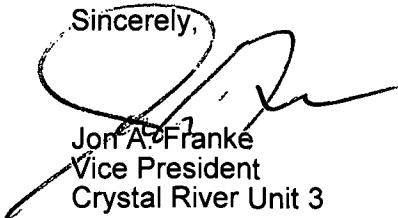
Dear Sir:

On December 16, 2008, Florida Power Corporation (FPC), doing business as Progress Energy Florida, Inc. (PEF), requested renewal of the operating license for Crystal River Unit 3 (CR-3) to extend the term of its operating license an additional 20 years beyond the current expiration date (Reference 1). Subsequently, the Nuclear Regulatory Commission (NRC), by letter dated March 31, 2011, provided a request for additional information (RAI) concerning the CR-3 License Renewal Application (Reference 2). Enclosure 1 to this letter provides the response to Reference 2 and includes supplemental responses to RAIs 3.3.2.2.4-1 and 3.31.53-2 that were requested during recent discussions with the NRC staff. In addition, Enclosure 2 to this letter contains Amendment #20 to the License Renewal Application.

No new regulatory commitments are contained in this submittal; however, the RAI responses have resulted in revised implementation details applicable to License Renewal Commitment #15. Details are described in Enclosure 2.

If you have any questions regarding this submittal, please contact Mr. Mike Heath, Supervisor, License Renewal, at (910) 457-3487, e-mail at [mike.heath@pgnmail.com](mailto:mike.heath@pgnmail.com).

Sincerely,



Jon A. Franke  
Vice President  
Crystal River Unit 3

JAF/dwh

- Enclosures:
1. Response to Request for Additional Information
  2. Amendment #20 Changes to the License Renewal Application

xc: NRC CR-3 Project Manager  
NRC License Renewal Project Manager  
NRC Regional Administrator, Region II  
Senior Resident Inspector

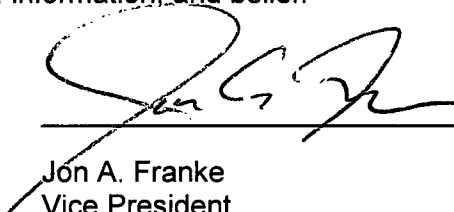
Progress Energy Florida, Inc.  
Crystal River Nuclear Plant  
15760 W. Power Line Street  
Crystal River, FL 34428

A140  
MRK

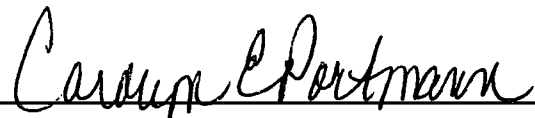
**STATE OF FLORIDA**

**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 26 day of April, 2011, by Jon A. Franke.

  
\_\_\_\_\_  
Signature of Notary Public  
State of Florida



(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**

**ENCLOSURE 1**

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

## REQUEST FOR ADDITIONAL INFORMATION

### **RAI B.2.22-4**

#### Background:

In its August 9, 2010, response to RAI B.2.22-2, the applicant stated that it has conducted Remote Field Transformer Coupling (RFTC) of the pre-stressed cylindrical discharge conduits used in the nuclear services and decay heat seawater system and found them to be in good condition. The applicant also stated that RFTC testing will be conducted again prior to the period of extended operation, in accordance with the Open-Cycle Cooling Water System Program.

#### Issue:

The staff believes that given that prestressed cylindrical concrete can degrade during the period of extended operation if cracks in the concrete allow raw water to enter the structure and corrode reinforcing wires, RFTC testing should be repeated in each of the 10-year periods of extended operation. This frequency of testing would allow for the timely identification of cracking in the concrete.

#### Request:

Update the buried piping and tank inspection program to include conducting RFTC testing of the nuclear services and decay heat seawater system discharge conduits in each of the two 10-year periods of extended operation or state why this testing is not needed to ensure that the CLB function(s) of the systems are maintained.

#### Response:

*The Crystal River Unit 3 (CR-3) Buried Piping and Tanks Inspection Program has been updated to incorporate RFTC testing of the Nuclear Services and Decay Heat Seawater System discharge conduits on a 10-year frequency (i.e., in each of the two 10-year periods) during the period of extended operation.*

*This response involves a change to the License Renewal Application (LRA); refer to the specific change discussed in Enclosure 2.*

### **RAI B.2.22-5**

#### Background:

In its August 9, 2010, response to RAI B.2.22-2 and its December 8, 2010, response to RAI B.2.22-3, the applicant committed to additional buried in-scope piping inspections based on industry operating experience. The response also described what systems are protected by cathodic protection and that the cathodic protection system is maintained to NACE standards.

Issue:

10 CFR 54.21 (d) states that “[t]he FSAR supplement for the facility must contain a summary description of the programs and activities for managing the effects of aging.” The proposed FSAR supplement does not reflect the planned number and frequency of buried in-scope piping inspections planned for the 30 year period starting 10 years prior to the period of extended operation. It also does not state that for those systems protected by the cathodic protection system, that it is provided and maintained in accordance with NACE standards.

Request:

Revise the UFSAR supplement to reflect the number and frequency of inspections planned for all in-scope buried pipe, which systems are provided cathodic protection, and that the cathodic protection system will be maintained to NACE standards.

**Response:**

*The CR-3 FSAR license renewal supplement description of the CR-3 Buried Piping and Tanks Inspection Program has been revised to incorporate the number and frequency of inspections planned for all buried piping in the program, to identify which systems are provided cathodic protection, and to reflect that these cathodic protection systems will be maintained consistent with the guidance of NACE standards.*

*This response involves a change to the LRA; refer to the specific change discussed in Enclosure 2.*

**RAI 3.3.2.2.4-1 (Supplemental Response)**

*The following information supplements the original response to RAI 3.3.2.2.4-1 that was submitted in the CR-3 to NRC letter, 3F1210-06, dated December 16, 2010 (Accession # ML103540095).*

**Response (initial):**

*The final paragraph of the original response stated:*

*“Based on the previous discussion, cracking due to cyclic loading is not applicable to the letdown cooler components based on the design and operational changes implemented at CR-3. Cracking due to stress corrosion cracking remains as an applicable effect for the letdown cooler components, and is managed using the Water Chemistry Program, with verification of program effectiveness provided by the One-Time Inspection Program. The Water Chemistry Program relies on monitoring and control of water chemistry to effectively mitigate aging effects on component surfaces that are exposed to water as a process fluid. The One-Time Inspection Program is a sampling-based program that uses one-time inspections to verify the effectiveness of an aging management program. While access limitations may preempt the letdown coolers from being selected for inspection, inspections of components having similar materials and exposed to comparable environments will serve to verify the effectiveness of the Water Chemistry Program.”*

*The supplemental response involves a revision of the final paragraph such that the final sentence is changed to read:*

*While access limitations may preempt the letdown coolers from being selected for inspection, inspections will be performed of surrogate components having similar material, similar form, and exposed to a comparable environment to verify the effectiveness of the Water Chemistry Program.*

**RAI 3.31.53-2 (Supplemental Response)**

*The following information supplements the original response to RAI 3.31.53-2 that was submitted in the CR-3 to NRC letter, 3F1110-02, dated November 12, 2010 (Accession # ML103200064).*

**Response (initial):**

*The original response stated:*

*"Crystal River Unit 3 (CR-3) assumes that the environment for the compressed air system components downstream of the system dryers has the potential for moisture and/or condensation, and therefore, the potential for age-related corrosion requiring aging management. CR-3 will utilize the Compressed Air Monitoring Program to manage aging of piping, piping components, and piping elements identified in the CR-3 License Renewal Application (LRA) as exposed to a "dried air (inside)" environment, which would be subject to the potential of corrosion presuming the presence of moisture. The CR-3 Compressed Air Monitoring Program relies on monitoring and testing of compressed air quality to preclude the incidence of moisture, and preventive maintenance and opportunistic inspections to verify that loss of material is not occurring. The CR-3 Compressed Air Monitoring Program is consistent with the program description in NUREG-1801, "Generic Aging Lessons Learned (GALL)," Revision 2 (draft), Volume 2, Section XI.M24 (Accession # ML102660219)."*

**Response (supplemental):**

*Add the following paragraph to the original response:*

*CR-3 has performed a comparison of the Compressed Air Monitoring Program description found in the draft revision of NUREG-1801, Revision 2, with that in the final issue of NUREG-1801, Revision 2. This review concluded that the two versions of the program description have negligible differences, such that the CR-3 Compressed Air Monitoring Program is consistent with both the draft and final versions of the program description.*

*This supplemental RAI response involves changes to the LRA; refer to the specific changes discussed in Enclosure 2.*

**PROGRESS ENERGY FLORIDA, INC.**

**CRYSTAL RIVER UNIT 3**

**DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72**

**ENCLOSURE 2**

**AMENDMENT #20 CHANGES TO THE LICENSE RENEWAL  
APPLICATION**

**Amendment #20 Changes to the License Renewal Application**

Source of Change	License Renewal Application (LRA) Amendment #20 Changes					
<p>RAI B.2.22-4 and RAI B.2.22-5</p>	<p>Revise LRA Table 3.3.2-49 on page 3.3-347 to include the following additional aging management review (AMR) information for the reinforced concrete piping in the Nuclear Service and Decay Heat Sea Water System that is subjected to the Open-Cycle Cooling Water (Inside) environment. Add this AMR line immediately prior to the AMR line that employs the Open-Cycle Cooling Water System aging management program.</p> <table border="1" data-bbox="474 535 1331 781"> <tr> <td data-bbox="474 535 812 781">                     Change in Material Properties due to Various Degradation Mechanisms                      Cracking due to Various Degradation Mechanisms                      Loss of Material due to Various Degradation Mechanisms                 </td> <td data-bbox="812 535 1039 781">                     Buried Piping and Tanks Inspection                 </td> <td data-bbox="1039 535 1136 781"></td> <td data-bbox="1136 535 1234 781"></td> <td data-bbox="1234 535 1331 781">                     J, 303                 </td> </tr> </table> <p>In LRA Subsection A.1.1.20 on page A-13, revise the first sentence of the description to read:</p> <p style="padding-left: 40px;">The Buried Piping and Tanks Inspection Program is a new program that manages the aging effect of loss of material for the external surfaces of buried steel piping components, as well as cracking and degradation of material properties of concrete, in CR-3 systems within the scope of License Renewal.</p> <p>In addition, add the following paragraph to Subsection A.1.1.20 after the discussion of the Nuclear Services and Decay Heat Seawater System inlet conduits that was added by LRA Amendment #12 in the CR-3 to NRC letter, 3F0810-01, dated August 9, 2010 (Accession # ML102230030):</p> <p style="padding-left: 40px;">The following table outlines the minimum inspection schedule prescribed for the Buried Piping and Tanks Inspection Program:</p> <p>(Note that the subject minimum inspection schedule table is enclosed as Attachment 1 immediately following this table.)</p> <p>In LRA Subsection B.2.20 on page B-67, revise the first sentence of the Program Description to read:</p> <p style="padding-left: 40px;">The Buried Piping and Tanks Inspection Program manages the aging effect of loss of material for the external surfaces of buried steel components, as well as cracking and degradation of material properties of concrete, in CR-3 systems within the scope of License Renewal.</p> <p>Also revise the fourth sentence of the Program Description on page B-67 to read:</p> <p style="padding-left: 40px;">The aging effects/mechanisms of concern are loss of material due to general, galvanic, pitting, and crevice corrosion and MIC, as well as cracking and degradation of material properties associated with concrete piping.</p>	Change in Material Properties due to Various Degradation Mechanisms Cracking due to Various Degradation Mechanisms Loss of Material due to Various Degradation Mechanisms	Buried Piping and Tanks Inspection			J, 303
Change in Material Properties due to Various Degradation Mechanisms Cracking due to Various Degradation Mechanisms Loss of Material due to Various Degradation Mechanisms	Buried Piping and Tanks Inspection			J, 303		



<b>Source of Change</b>	<b>License Renewal Application (LRA) Amendment #20 Changes</b>
RAI 3.31.53-2 Supplement	<p>LRA Amendment #13 was submitted by CR-3 to NRC letter, 3F1110-02, dated November 12, 2010 (Accession # ML103200064). LRA Amendment #13 made revisions to Table B-1 on page B-8 and to the NUREG-1801 Consistency statement on page B-69 to indicate that the Compressed Air Monitoring Program is consistent with NUREG-1801 (Revision 2, draft), Section XI.M24. Based on the supplementary response to RAI 3.31.53-2, revise these statements to remove the word "draft" wherever reference is made to the revision of NUREG-1801 in the discussion of the Compressed Air Monitoring Program.</p> <p>Also, revise the Discussion column of LRA Table 3.3.1, for line items 3.3.1-53 and 3.3.1-54 on page 3.3-85, to state:</p> <p>CR-3 uses the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program and the Compressed Air Monitoring Program to manage corrosion of internal surfaces of compressed air system components that might be subject to internal condensation. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program is credited with managing components from the air compressors through the dryers. The Compressed Air Monitoring Program, which includes monitoring of air quality in addition to inspections, is credited with managing compressed air components downstream of the dryers.</p>

**Buried Piping and Tanks Inspection Program Inspections and Schedule**

<b>System</b>	<b>Cath. Prot. **</b>	<b>30 - 40 Yr Inspections *</b>	<b>40 - 50 Yr Inspections *</b>	<b>50 - 60 Yr Inspections *</b>	<b>Comments</b>
Condensate	Y	One inspection of at least 10 feet aggregate length	One inspection of at least 10 feet aggregate length	One inspection of at least 10 feet aggregate length	Condensate piping to Emergency Feedwater tank / pumps
	N	One inspection of at least 10 feet aggregate length	One inspection of at least 10 feet aggregate length	One inspection of at least 10 feet aggregate length	Condensate Storage Tank piping to Auxiliary Feedwater and Condensate Pumps
Emergency Feedwater	Y	At least one inspection, with at least 20 feet aggregate length	At least one inspection, with at least 20 feet aggregate length	At least one inspection, with at least 20 feet aggregate length	Alternately, at least 2 inspections of at least 10 feet per interval
Fire Protection	N	Opportunistic Inspections	Opportunistic Inspections	Opportunistic Inspections	System integrity verified by routine monitoring of Fire Protection jockey pump operation
Fuel Oil	Y	One inspection of at least 10 feet aggregate length	One inspection of at least 10 feet aggregate length	One inspection of at least 10 feet aggregate length	
Nuclear Services & Decay Heat Seawater	N	One inspection of at least 25% aggregate length of intake conduits	One inspection of at least 25% aggregate length of intake conduits	One inspection of at least 25% aggregate length of intake conduits	Intake Conduits - inspections to be performed using qualified methods. Subsequent inspection frequency based on initial results, not to exceed 10 years.
Nuclear Services & Decay Heat Seawater	N	At least one inspection of both discharge conduits	At least one inspection of both discharge conduits	At least one inspection of both discharge conduits	Discharge Conduits - Remote Field Transformer Coupling testing

Notes: \* CR-3 may substitute internal non-destructive examinations, pressure testing, or direct visual inspections as described in Program Description XI.M41 of NUREG-1801, draft Revision 2.

\*\* Cathodic protection system maintained consistent with the guidance of NACE SP0169-2007 (or later applicable standard).