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

Ref: 10 CFR 54

March 3, 2010
3F0310-01

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 #10

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 February 2, 2010, "Request for Additional Information for the Review of the Crystal River Unit 3 Nuclear Generating Plant License Renewal Application (TAC NO. ME0274)"

(3) CR-3 to NRC letter, 3F1009-07, dated October 13, 2009, "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 #5"

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 February 2, 2010 (Reference 2), provided a request for additional information (RAI) concerning the CR-3 License Renewal Application (LRA). Enclosure 1 to this letter provides the response to Reference 2 and a supplemental response to RAI 4.3.3-3 from Reference 3. Enclosure 2 includes changes to the LRA commensurate with the RAI responses. Also, the CR-3 License Renewal Commitments, updated to reflect changes made during the NRC staff's review of the LRA, are included in Enclosure 3.

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.

Sincerely,

Jon A. Franke
Vice President
Crystal River Unit 3

JAF/dwh

Enclosures:
1. Response to Request for Additional Information
2. Amendment #10, Changes to the License Renewal Application
3. CR-3 License Renewal Commitments, Revision 2

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

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

A035
NRR

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 3 day of March, 2010, by Jon A. Franke.

Carolyn E Portmann

Signature of Notary Public
State of Florida

CAROLYN E. PORTMANN
Notary Public - State of Florida
My Commission Expires Mar 1, 2010
Commission # DD 524380
Bonded By National Notary Assn.

(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

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Request for Additional Information (RAI) B.2.9-2.1

Background

During the audit of Program Elements 1-6 (Scope, Preventive Actions, Parameters Monitored or Inspected, Detection of Aging Effects Monitoring and Trending, and Acceptance Criteria) of the Steam Generator Tube Integrity Program, the staff found that sufficient information was not available to determine whether these elements of the license renewal application (LRA) aging management program (AMP) were consistent with the corresponding elements of the Generic Aging Lessons Learned (GALL) Report AMP.

The staff identified numerous potential discrepancies within the same procedure, between different procedures, between the Crystal River Unit 3 Nuclear Generating Plant (CR-3) procedures and various industry guidelines (referenced in Nuclear Energy Institute [NEI] 97-06), and between the procedures and the technical specifications. The staff issued RAI B.2.9-2 to address this concern requesting a discussion of the applicant's plans to perform a comprehensive review of its Steam Generator Tube Integrity Program to ensure the procedures are internally consistent, will ensure compliance with the technical specifications, and are consistent with NEI 97-06. In order to illustrate its question the staff also provided in RAI B.2.9-2 30 examples of the discrepancies it found.

Issue

In its response to RAI B.2.9-2, dated October 13, 2009, the applicant stated that the Steam Generator Tube Integrity Program is defined as an "Engineering Program" per corporate procedure and is reviewed on a frequency not to exceed two years. It also explained that the most recent assessment (March 2008) concluded that the program met the requirements of the Technical Specifications. The applicant further stated that this review process would ensure that the procedures are internally consistent and compliant with the technical specifications, and are consistent with NEI 97-06.

On one hand, the staff noted that the applicant's response to RAI B.2.9-2 stated that CR-3 Steam Generator Tube Integrity Program met the requirements of the technical specifications. On the other hand, during its audit, the staff identified many points that challenge this statement. It is not clear either to the staff, how the review process the applicant will use to review its procedures in 2010, at the latest, will be more effective for its next assessment than for the assessment in 2008.

Moreover, the staff cannot verify that the modifications to be made to the program and its implementing procedures will be consistent with the GALL Report.

Request

Based on the staff's review of the program documents that were (apparently) found acceptable by the 2008 assessment of the Steam Generator Tube Integrity Program:

1. Describe why your "Engineering Program" assessment of March 2008 did not identify the inconsistencies that the U.S. Nuclear Regulatory Commission (NRC) staff identified during its audit of your Steam Generator Tube Integrity Program, as described in RAI B.2.9-2.

2. Clarify how your "Engineering Program" review process, as applied to the Steam Generator Tube Integrity Program, will be effective during future implementation in providing assurance that the revised procedures will be internally consistent, compliant with the technical specifications, and consistent with NEI 97-06 during the renewed license period.

This same request applies to the response to RAI B.2.9-3 since Florida Power Corporation has supported the response to that RAI on its response to RAI B.2.9-2 about the program review process.

Response

1. *The "Engineering Program" assessment referenced in response to RAI B.2.9-2 was focused on the Operational Assessment justifying operation to the end of the current operating cycle. The assessment also focused on the pre-service eddy current plans for the replacement steam generators and outage readiness. This assessment did not include a detailed review of all the associated procedures. The potential discrepancies identified during the NRC audit have been documented in the CR-3 Corrective Action Program.*

2. *Based on the findings of the NRC audit, CR-3 will add a commitment to enhance the procedures to comply with the requirements of the Steam Generator Tube Integrity Program described in NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," Revision 1, Section XI.M19. These enhancements will be completed prior to the period of extended operation.*

This response has resulted in changes to the LRA documented in Enclosure 2 and the addition of Commitment #30 to the list of CR-3 License Renewal Commitments in Enclosure 3.

RAI B.2.13-2.1

Background

In its response to NRC's RAI B2.13-2, dated October 13, 2009, the applicant stated that it visually inspected fire barrier walls, ceilings and floors on a frequency commensurate with the safety significance of the structure and its condition but not to exceed ten years. The GALL Report recommends performing visual inspections of fire barrier walls, ceilings and floors at least once every refueling outage. The applicant stated that the basis for the increased interval for structural inspections is the applicant's reinforced concrete that has been acceptable during previous inspections with only minor degradation recorded in 33 years. The applicant further stated that it planned to reassess the structural inspection frequency based on the condition of the structure.

Issues

The applicant's proposed fire barrier visual inspection frequency exceeds the recommended frequency of given in the GALL Report.

Request

For those fire barrier walls, ceilings, and floors that exceed a five-year inspection frequency:

1. Describe the process for maintaining the integrity of fire barrier walls, ceiling, and floors during normal plant operations and also during plant modifications. Explain the controls that are in place to prevent inadvertent breaches to fire barrier walls, ceilings, and floors.

2. Describe the current surveillance requirements for fire barrier walls, ceilings, and floors per the Technical Requirements Manual.

3. Are all parts of fire barrier walls, ceilings, and floors inspected during each surveillance or is only a percentage done each time which would complete the surveillance over a specific time period (i.e. 10% per year for 10 years)?

4. Are fire barrier walls, ceilings, and floors inspected under any other program and if so what is the frequency of the inspections and inspection criteria?

Response

CR-3 will inspect the fire barrier walls, ceilings, and floors on a frequency of at least once every five years, during the period of extended operation.

This response has resulted in changes to the LRA documented in Enclosure 2 and the modification of CR-3 License Renewal Commitments #8 and #20 shown in Enclosure 3.

RAI B.2.21-3

Background

LRA Section B.2.21, "One-Time Inspection of ASME Code Class 1 Small-Bore Piping," states that the program is consistent with the program elements in the GALL Report AMP XI.M35, "One-Time Inspection of ASME Code Class 1 Small Bore Piping." The LRA also states that CR-3 has experienced cracking in ASME Code Class 1 small bore piping. The LRA states that in 1982 CR-3 experienced a failure of a weld associated with the normal duty makeup line. The subsequent report on the failure stated that initiation of the inner diameter crack was due to thermal fatigue and propagation probably occurred by combined mechanical and thermal loading. The report also stated that the outer diameter crack initiation and propagation probably occurred by mechanical loading of the system. The LRA also identified a crack in the High-Pressure Injection thermal sleeve in 2003.

Issue

The GALL Report, Section XI.M35, recommends the use of the One-Time Inspection of ASME Code Class 1 Small-Bore Piping only for those plants that have not experienced cracking of ASME Code Class 1 small-bore piping resulting from stress corrosion or thermal and mechanical loading. For those plants that have previous operating experience that shows evidence of significant aging the GALL Report recommends periodic inspection of the subject piping to be managed by a plant-specific aging management program.

Request

Given CR-3's operating experience as discussed in the LRA, provide justification why periodic inspections, are not necessary for all ASME Code Class 1 small-bore piping within the scope of license renewal.

Response

The initial position in the CR-3 LRA, that the One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program was consistent with the GALL Report, Section XI.M35, considered that the cracking of High Pressure Injection (HPI)/Makeup (MU) nozzles in the CR-3 operating history was attributed to specific configuration and operational factors, limited to a discrete set of locations, and not applicable to aging management of the balance of CR-3 Class 1 small-bore piping. CR-3 LRA, Section B.2.1, includes the following description:

> *CR-3 Operating Experience includes cracking of HPI Nozzles/Thermal Sleeves. Cracking was initially detected in a weld in the safe end/thermal sleeve region of the normal duty makeup line. Investigation as to the cause of cracking identified concerns with the design/installation of the existing thermal sleeves. Corrective actions included the replacement of all four of the thermal sleeves with a modified design. Follow-up actions include a commitment to perform nondestructive examination to confirm nozzle and thermal sleeve integrity during selected refueling outages. These inspections have been integrated into the CR-3 4th Ten-Year Interval Inservice Inspection (ISI) Program. Notably, these small-bore Class 1 lines would ordinarily be subject to a sampling based verification of integrity under the CR-3 One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program. Since cracking has already been detected in these lines, they will not be included in sample populations under this program, but rather will default to the defined inspection schedule in the CR-3 ASME Code Section XI Program.*

CR-3 has revised its aging management approach for cracking of Class 1 small-bore piping to align with the NRC staff's interpretation that any cracking of Class 1 small-bore piping preempts the use of one time inspections for aging management. CR-3 currently performs volumetric examinations of Class 1 small-bore piping circumferential welds using Risk Informed (RI-ISI) methodology, as approved in the CR-3 4th Ten-Year Interval ISI Program. CR-3 will utilize periodic inspections of Class 1 small-bore piping under the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program for aging management of cracking of Class 1 small-bore piping, in lieu of the One-Time Inspection of ASME Code Class 1, Small Bore Piping Program, where one time inspections were previously specified. In addition, CR-3 will perform periodic volumetric examinations of ASME Code Class 1 small-bore socket welds during the period of extended operation. The total number of socket welds selected for examination will be at least 10% of the total population per interval. The examinations will

detect and size discontinuities within the specified examination volume, and will begin at such time as an acceptable nuclear industry methodology for nondestructive socket weld examination becomes available. For socket welds, a destructive examination may be performed on an opportunistic basis in lieu of the volumetric examinations.

Since volumetric inspection of Class 1 small-bore piping welds is not an activity described in the GALL Report AMP XI.M1 program description, the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program is now considered to be consistent with NUREG-1801, with an exception. This exception is justified on the basis that volumetric examinations are more rigorous than the visual examinations specified in ASME Section XI, Subsection IWB for Class 1 small-bore piping. The ASME Section XI, Subsection IWB, IWC, and IWD Program scope includes various plant-specific inspections performed to detect degradation of components. Volumetric inspections of small-bore piping under the Program, is a plant-specific activity.

This response has resulted in changes to the LRA documented in Enclosure 2 and the modification of CR-3 License Renewal Commitment #16 shown in Enclosure 3.

RAI B.3.6-3.1

Background

In a letter dated September 30, 2009, the staff issued RAI 3.6-3 requesting the applicant to explain why insulation material of non-environmentally qualified (EQ) electrical/instrumentation and control penetration is not subject to aging degradation. In response to the staff's request, in a letter dated December 3, 2009, the applicant stated that the penetrations' primary insulation materials are essentially cable conductor insulation materials. The primary insulation materials for the non-EQ penetration assemblies, subject to aging management review (AMR), are identical to the penetration assemblies in the EQ program in both composition and function. All penetration assemblies subject to AMR are located in the Intermediate and Reactor Buildings. The applicant also stated that all penetration assemblies in the EQ program are qualified by test for the worst-case design basis accident (DBA) condition in the Intermediate and Reactor Buildings. The non-EQ penetration assemblies subject to AMR are not required to remain functional during or following a design basis accident. The applicant further stated that penetration assemblies in the EQ program are qualified for post-accident operation and the EQ test profile envelope the (non-accident) temperature and radiation environment in both the Intermediate and Reactor Buildings. Therefore, the applicant stated that since the non-EQ penetration assemblies are not required to remain functional during or following a design basis accident, and their insulation materials have been tested to the worst case DBA conditions in the Intermediate and Reactor Buildings, the insulation materials for the non-EQ penetration assemblies are acceptable for 60-year service. The applicant further stated that penetration assembly pigtails available for visual inspection are covered under the NUREG-1801, AMP XI.E1 Program, "Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements."

The staff reviewed the applicant response and questioned the applicant's technical justification for not managing the cable conductor insulation inside the electrical penetration assemblies. First, the applicant stated that electrical penetration assemblies are qualified for post-accident and the EQ test profile envelope the non-accident temperature and radiation environment of the

non-EQ electrical containment penetration. The aging of EQ electrical containment penetration is different than the aging of the non-EQ installed in an adverse localized environment due to high heat, radiation, or moisture. For EQ, the electrical containment penetration is pre-aged at a higher temperature or higher radiation for a short period of time to simulate aging in the normal operation environment for a qualified life (typically 40 years). The containment penetration insulation material is then subject to higher temperature and/or higher dose of radiation in a test chamber to stimulate the design basis accident (a loss of coolant accident or a main steam line break). This is different than aging of insulation material installed in high heat and high radiation for a long period of time. In these environments, conductor insulation material may be degraded more rapidly than expected. The argument, using EQ to envelop the non-EQ installed in high heat and/or high radiation environments, may not be adequate to justify why the non-EQ penetration are acceptable for 60-year service life without any aging management. Second, the applicant stated that non-EQ containment penetration assemblies are not required to remain functional during or following a design basis accident. The non-EQ performs an intended function by providing a pressure boundary function during accident conditions. Degradation of non-EQ containment penetration could challenge the pressure boundary function and could release radioactive products to the atmosphere.

Issue

For cable conductor insulation materials inside non-EQ containment penetration assemblies, the applicant has not explained why the insulation materials inside non-EQ containment penetration are good for 60 year service and not subject to aging requiring management.

Request

Identify current activities that monitor the conditions of conductor insulator materials inside the electrical containment penetration or provide additional technical justification of why these materials are not subject to aging degradation.

Response

The conductor insulating materials for the non-EQ containment penetration assemblies consist of cross-linked polyolefin (XLPO) - heat shrink, silicone rubber (SR) - insulating boot, and Kapton - conductor insulation. A 60-year service-limiting environment is the environment to which an insulation material can be exposed for 60 years and still perform its design function. These criteria are based on the aging properties of the insulation materials as they relate to the applicable stressors of heat and radiation. The 60-year service-limiting environments for the conductor insulating materials are shown in the table below.

Insulation Material	***Bounding 60-Year Service-Limiting Environment***	
	Temperature	***Dose (rads)***
XLPO	*188°F (86.6°C)*	*1×10^8*
SR	*273°F (133.9°C)*	*3×10^6*
Kapton	*266°F (130.2°C)*	*2×10^8*

The worst-case normal operating environment on either the inboard side (i.e., the Reactor Building side) or outboard side (i.e., the Intermediate Building side) of the penetration assembly is 140°F (60°C) and 1.43×10^6 rads (60-year dose).

Examination of the table above shows that the conductor insulation materials are bounded for the service conditions of the non-EQ containment penetration assemblies. Since these insulation materials are aptly suited for 60-year service, no aging management program is warranted for these insulating materials.

Furthermore, similar cable insulating materials are installed in the Reactor Building and will be subject to the NUREG-1801, AMP XI.E1 Program, "Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements." The inspections associated with the AMP XI.E1 Program provide reasonable assurance of the continued functionality of the cables internal to the electrical penetrations.

The pressure boundary function of the non-EQ containment penetrations is managed by the ASME Section XI, Subsection IWE and 10 CFR Part 50, Appendix J Programs.

RAI 4.3.3-3, Part 3, Supplemental Response

The following information supplements the response to Part 3 of RAI 4.3.3-3 submitted in CR-3 letter to the NRC, 3F1009-07: "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 #5" (ADAMS Accession No. ML092890155).

3. *Samples are not taken at a single location. Sampling is performed at the following locations:*

   - *Reactor Coolant Pump (RCP-1D) Suction (See Drawing 302-651-LR, Sheet 1, Coordinate D8)*
   - *Pressurizer Liquid Sampling (See Drawing 302-651-LR, Sheet 1, Coordinate C5)*
   - *Makeup and Purification Demineralizer Influent (See Drawing 302-661-LR, Sheet 1, Coordinate D2)*

   The CR-3 Water Chemistry Program is consistent with the program described in NUREG-1801, XI.M2, and relies on the EPRI Water Chemistry Guidelines. In addition to sampling to ensure that dissolved oxygen levels are minimized, hydrogen is added to the Makeup Tank to maintain an excess hydrogen inventory in the Reactor Coolant System (RCS). The hydrogen inventory in the RCS is controlled by maintaining an overpressure in the Makeup Tank. Hydrogen addition and maintaining a hydrogen overpressure in the reactor coolant ensure that oxygen introduced into the system and oxygen species produced by radiolysis are adequately suppressed in order to prevent oxidizing conditions. Hydrogen also maintains reducing conditions in the primary coolant to minimize primary system corrosion. The Water Chemistry Program maintains oxygen levels as low as reasonably possible to minimize corrosion, prevent general system corrosion, and reduce the probability of stress corrosion cracking of austenitic stainless steels in the system.

   The combination of sampling dissolved oxygen and maintaining hydrogen overpressure in the RCS to scavenge oxygen species ensures the dissolved oxygen is maintained as low as reasonable possible throughout the RCS.

PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

ENCLOSURE 2

AMENDMENT #10
CHANGES TO THE LICENSE RENEWAL APPLICATION

Amendment #10
Changes to the License Renewal Application

Source of Change	License Renewal Application Amendment #10 Changes
RAI B.2.9-2.1	Revise LRA Subsection A.1.9 on Page A-9 to add the following paragraph: Prior to the period of extended operation, the Steam Generator Tube Integrity Program implementing procedures will be enhanced to ensure compliance with the requirements in NUREG-1801, Revision 1, Section XI.M19. This change constitutes CR-3 License Renewal Commitment #30 in Enclosure 3. Revise the NUREG-1801 Comparison for the Steam Generator Tube Integrity Program on LRA Table B-1 on Page B-8 to state that it is an "Existing program consistent with NUREG-1801 with enhancement." In LRA Subsection B.2.9, on Page B-33, revise the NUREG-1801 Consistency statement to read: The Steam Generator Integrity Program is an existing program that, following enhancement, will be consistent with NUREG-1801, Section XI.M19. Add an enhancement to LRA Subsection B.2.9, on Page B-33, by replacing the word "None" with the following: Prior to the period of extended operation, the below-listed enhancement will be implemented: <u>Program Elements Affected</u> • **Scope of Program** The implementing procedures for the Program will be enhanced to ensure compliance with the requirements described in NUREG-1801, Section XI.M19.
RAI B.2.13-2.1	Add the following enhancement to the second paragraph of LRA Subsection A.1.1.13 on Page A-10: (5) specify inspections of fire barrier walls, ceilings, and floors on a frequency of at least once every five years. Add the following enhancement to the second paragraph of LRA Subsection A.1.1.30 on Page A-17: (12) require periodic inspection of structures on a frequency of at least once every five years. The above enhancements impact Commitments #8 and #20 as shown in Enclosure 3. Revise Exception 2) of Exceptions to NUREG-1801 in LRA Subsection B.2.13, Detection of Aging effects on Page B-45 to replace the existing text as follows: (continued)

Source of Change	License Renewal Application Amendment #10 Changes
RAI B.2.13-2.1 (continued)	2) NUREG-1801 recommends visual inspection of fire barrier walls, ceilings, and floors be performed at least once every refueling outage. The CR-3 Fire Protection Program will perform inspections of fire barrier walls, ceilings, and floors on frequency of at least once every five years. The exception is acceptable since CR-3 OE has not detected degradation of fire barrier walls, ceilings, and floors which has resulted in a loss of fire barrier function. The structural inspections are sufficient to detect gradual degradation of the fire barrier walls, ceilings, and floors. Inspections may be performed more frequently depending on the as-found condition. Revise LRA Subsection B.2.13, Enhancements, under program element **Detection of Aging Effects** on Page B-46, to number the existing enhancement 1) and add the following: 2) The Fire Protection Program administrative controls for periodic visual inspections of fire barrier walls, ceilings, and floors will be enhanced to specify inspections on a frequency of at least once every five years. Revise LRA Subsection B.2.13, Enhancements, for program element **Monitoring and Trending** on Page B-46, to read: The program enhancements described above under the "Parameters Monitored/ Inspected" program element and enhancement 2) under "Detection of Aging Effects" are necessary for consistency with this NUREG-1801 program element. Add an enhancement to LRA Subsection B.2.30, on Page B-91 prior to the discussion of Operating Experience as follows: • **Detection of Aging Effects** Administrative controls that implement the Program will be revised to require periodic inspection of structures on a frequency of at least once every five years.
RAI B.2.21-3	On LRA Page 3.1-4, delete the One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program from the list of Aging Management Programs in Section 3.1.2.1.1. On LRA Page 3.1-5, delete the One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program from the list of Aging Management Programs in Section 3.1.2.1.3. Delete the One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program from the second paragraph of Subsection 3.1.2.2.7.1 on Page 3.1-8. Beginning on Page 3.1-13, for LRA Table 3.1.1 items that credit the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program, delete any statements that the item is consistent with NUREG-1801. These changes reflect that the AMP consistency with NUREG-1801 has been changed from consistent to consistent with exceptions. The Discussion column for LRA Item 3.1.1-70 on Page 3.1-28 is revised to delete the statement of consistency with NUREG-1801 and to omit credit for the One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program. (continued)

Source of Change	License Renewal Application Amendment #10 Changes
RAI B.2.21-3 (continued)	On LRA Table 3.1.2-1 on Page 3.1-99, delete the One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program from the programs credited for cracking of RCPB Piping: Class 1 piping, fittings and branch connections <NPS 4. Also, Generic Note "A" becomes Generic Note "E". On LRA Table 3.1.2-1 on Pages 3.1-100 and 3.1-101, delete the One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program from the programs credited for cracking of RCPB Piping: High Point Vent and Post Accident Sampling Flow Restrictors for both M-1 and M-3 intended functions. Generic Note "A" becomes Generic Note "E" in both locations. On LRA Table 3.1.2-1 on Pages 3.1-109 and 3.1-110, delete the One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program from the programs credited for cracking of RCPB Piping: Class 1 Valve Bodies for both Cast Austenitic Stainless Steel and Stainless Steel. Generic Note "A" becomes Generic Note "E" in both locations. On LRA Table 3.1.2-3 on Page 3.1-143, delete the One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program from the programs credited for cracking of Incore Monitoring System Lines. Generic Note "A" becomes Generic Note "E". Add the following statement to the description of the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program immediately following the first sentence of LRA Subsection A.1.1.1 on LRA Page A-5: The Program includes periodic volumetric examinations of ASME Code Class 1 small-bore socket welds during the period of extended operation. The total number of socket welds selected for examination will be at least 10% of the total population per interval. The examinations will detect and size discontinuities within the specified examination volume, and will begin at such time as an acceptable nuclear industry methodology for nondestructive socket weld examination becomes available. A destructive examination may be performed on an opportunistic basis in lieu of the socket weld volumetric examinations. This change is also listed as a new Commitment #16 in Enclosure 3. For A.1.1.21 on LRA Table of Contents Page A-2 replace the title "One-Time Inspection of ASME Code Class 1 Small-Bore Piping" with "Not used" and on Page A-14, delete subsection A.1.1.21 text and replace the title "One-Time Inspection of ASME Code Class 1 Small-Bore Piping" with "Not used." For B.2.21 on LRA Table of Contents Page B-2 replace the title "One-Time Inspection of ASME Code Class 1 Small-Bore Piping" with "Not used." On LRA Table B-1 for program XI.M35 on Page B-9, revise the CR-3 Program column to read "Not credited for aging management," and revise the NUREG-1801 Comparison column to read "Not applicable." In LRA Subsection B.2.1, on Page B-12, add the following paragraph to the Program Description: (continued)

Source of Change	License Renewal Application Amendment #10 Changes
RAI B.2.21-3 (continued)	The Program includes periodic volumetric examinations of ASME Code Class 1 small-bore socket welds during the period of extended operation. The total number of socket welds selected for examination will be at least 10% of the total population per interval. The examinations will detect and size discontinuities within the specified examination volume, and will begin at such time as an acceptable nuclear industry methodology for nondestructive socket weld examination becomes available. A destructive examination may be performed on an opportunistic basis in lieu of the socket weld volumetric examinations. In addition, in Subsection B.2.1, revise the NUREG-1801 Consistency statement to read: The ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program is an existing program that is consistent with NUREG-1801, Section XI.M1, with exceptions. Add an exception to LRA Subsection B.2.1, on Page B-12, by replacing the word "None" with the following: <u>Program Elements Affected</u> • **Detection of Aging Effects** Implementation of the Risk-Informed Inservice Inspection Program at CR-3 incorporates volumetric examination of Class 1 small-bore (less than NPS 4 in.) piping. Since the use of volumetric examination to detect cracking of small-bore piping is not prescribed in the NUREG-1801 program description, this is considered an exception to NUREG-1801. This exception is justified on the basis that volumetric examinations are more rigorous than visual examinations specified in ASME Section XI, Subsection IWB for Class 1 small-bore piping. The ASME Section XI, Subsection IWB, IWC, and IWD Program scope includes various plant-specific inspections performed to detect degradation of components. Volumetric inspection of small-bore piping under the Program is a plant-specific activity. In LRA Subsection B.2.21, on Page B-69, delete the text for the entire program and replace the title "One-Time Inspection of ASME Code Class 1 Small-Bore Piping" with "Not used." In the AMR Tables in LRA Sections 3.1 through 3.4, for each line item that credits the ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program, change each Generic Note A to Note B and each Generic Note C to Note D. This is to reflect that the AMP consistency with NUREG-1801 has been changed from consistent to consistent with exceptions.

PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

ENCLOSURE 3

CR-3 LICENSE RENEWAL COMMITMENTS
REVISION 2

CRYSTAL RIVER UNIT 3 LICENSE RENEWAL COMMITMENTS, REVISION 2				
ITEM NO.	**COMMITMENT**	**FINAL SAFETY ANALYSIS REPORT (FSAR) SUPPLEMENT LOCATION**	**PROGRAM IMPLEMENTATION SCHEDULE**	**LICENSE RENEWAL APPLICATION (LRA) SOURCE**
1	In accordance with the guidance of NUREG-1801, Rev. 1, regarding aging management of reactor vessel internals components, CR-3 will: (1) participate in the industry programs for investigating and managing aging effects on reactor internals, (2) evaluate and implement the results of the industry programs as applicable to the reactor internals, and (3) upon completion of these programs, but not less than 24 months before entering the period of extended operation, submit an inspection plan for reactor internals to the NRC for review and approval.	A.1.1	As stated in the commitment	Reactor Vessel Internals Aging Management Activities LRA Section A.1.1
2	In accordance with the guidance of NUREG-1801, Rev. 1, regarding aging management of nickel alloy and nickel-clad components susceptible to primary water stress corrosion cracking, CR-3 will comply with applicable NRC Orders and will implement applicable: (1) Bulletins and Generic Letters and (2) staff-accepted industry guidelines.	A.1.1	As stated in the commitment	Primary Water Stress Corrosion Cracking of Nickel Alloys LRA Section A.1.1
3	The Program will be enhanced to select an alternate lubricant that is compatible with the fastener material and the contained fluid.	A.1.1.3	Prior to the period of extended operation	Reactor Head Closure Studs Program LRA Section B.2.3
4	The Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) Program is a new program to be implemented. When a Safety Evaluation Report is issued for MRP-227, any required actions that affect the aging management strategy for these components will be incorporated into the program documents.	A.1.1.6	Prior to the period of extended operation	Thermal Aging and Neutron Irradiation Embrittlement of Cast Austenitic Stainless Steel (CASS) Program LRA Section B.2.6 RAI B.2.6-1

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5	Program administrative control documents will be enhanced to include: (1) guidance for torquing and closure requirements based on the EPRI documents endorsed by NUREG-1801, (2) requirements to remove instances where molybdenum disulfide lubricant is allowed for use in bolting applications in specific procedures and to add a general prohibition against use of molybdenum disulfide lubricants for bolted connections, (3) guidance for torquing and closure requirements that include proper torquing of the bolts and checking for uniformity of gasket compression after assembly, (4) guidance for torquing and closure requirements based on the recommendations of EPRI NP-5769, "Degradation and Failure of Bolting in Nuclear Power Plants," (with exceptions noted in NUREG-1339), EPRI TR-104213, "Bolted Joint Maintenance & Applications Guide," and EPRI 5067, "Good Bolting Practices, A Reference Manual for Nuclear Power Plant Personnel," Volumes I and II, (5) a centralized procedure based on EPRI NP-5769, EPRI TR-104213, and EPRI-5067 containing guidance regarding bolted joint leak tightness and pre-installation inspections consistent with the recommendations of those documents, (6) periodic examinations of a representative sample of bolting identified as potentially having yield strength ≥150 ksi for SCC consisting of periodic in situ ultrasonic testing or, alternatively, surface examination or bolt replacement, with sample sizes based on EPRI TR-107514 methodology, (7) examination of NSSS support high strength bolting for SCC concurrent with examinations of the associated supports at least once per 10-year ISI period, and (8) acceptance standards for examination of high strength structural bolting consistent with the recommendations of EPRI NP-5769 or application specific structural analyses.	A.1.1.8	Prior to the period of extended operation	Bolting Integrity Program LRA Section B.2.8, RAI B.2.8-2, RAI B.2.8-3

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6	The Program will be enhanced to: (1) include the Nuclear Services and Decay Heat Seawater System Pumps in a periodic inspection and/or rebuild program. This Program will be initiated during the current license period and inspect one or more pumps prior to the period of extended operation, (2) subject the Nuclear Services and Decay Heat Seawater System Discharge Conduits to inspection and evaluation subsequent to the SG replacement project, but prior to the period of extended operation, in order to determine the extent of activities required during the period of extended operation to support the intended function of these components, (3) incorporate hardness/scratch testing for selective leaching into the examinations of susceptible pumps and valves and, if evidence of degradation is detected, of seawater heat exchanger tubesheet cladding, (4) incorporate Nuclear Services and Decay Heat Seawater System Intake Conduit inspections for degraded or missing concrete lining. Affected areas will be monitored to assure no loss of intended function until such time as the lining can be repaired, (5) incorporate acceptance criteria into procedures for inspections for biofouling and maintenance of protective linings, and (6) establish periodic maintenance activities for Nuclear Services and Decay Heat Seawater System expansion joints prior to the period of extended operation.	A.1.1.10	As stated in the commitment	Open-Cycle Cooling Water System Program LRA Section B.2.10, RAI B.2.10-1, RAI B.2.10-2, RAI B.2.10-3

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7	Administrative controls for the Program will be enhanced to: (1) include in the Program all cranes within the scope of License Renewal, (2) require the responsible engineer to be notified of unsatisfactory crane inspection results involving loss of material, (3) specify the frequency of inspections for the cranes within the scope of License Renewal to be every refueling outage for cranes in the Reactor Building and every two years for cranes outside the Reactor Building, and (4) clarify that crane rails are to be inspected for abnormal wear and that members to be inspected for cracking include welds.	A.1.1.12	Prior to the period of extended operation	Inspection of Overhead Heavy Load and Light Load Handling Systems Program LRA Section B.2.12
8	The Program administrative controls will be enhanced to: (1) include specific guidance for periodic inspection of fire barrier walls, ceilings, and floors including a requirement to notify Fire Protection of any deficiencies having the potential to adversely affect the fire barrier function, (2) include additional inspection criteria as described in NUREG-1801 for penetration seals, (3) include additional inspection criteria for corrosion of fire doors, (4) specify minimum qualification requirements for personnel performing visual inspections of penetrations seals and fire doors, and (5) specify inspections of fire barrier walls, ceilings, and floors on a frequency of at least once every five years.	A.1.1.13	Prior to the period of extended operation	Fire Protection Program LRA Section B.2.13, RAI B.2.13-2.1

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9	The Program will be enhanced to: (1) incorporate a requirement to perform one or a combination of the following two activities: (a) Implement periodic flow testing consistent with the intent of NFPA 25, or (b) Perform wall thickness evaluations to verify piping is not impaired by pipe scale, corrosion products, or other foreign maternal. For sprinkler systems, this may be done by flushing, internal inspection by removing one or more sprinkler heads, or by other obstruction investigation methods, (such as technically proven ultrasonic and X-ray examination) that have been evaluated as being capable of detecting obstructions. (These inspections will be performed before the end of the current operating term. The results from the initial inspections will be used to determine inspection intervals thereafter during the period of extended operation.), (2) perform internal inspections of system piping at representative locations as required to verify that loss of material due to corrosion has not impaired system intended function. Alternately, non-intrusive inspections (e.g., ultrasonic testing) can be used to verify piping integrity. (These inspections will be performed before the end of the current operating term. The results from the initial inspections will be used to determine inspection intervals thereafter during the period of extended operation.), (3) incorporate a requirement to perform a visual inspection of yard fire hydrants annually consistent with the intent of NFPA 25 to ensure timely detection of signs of degradation, such as corrosion, and (4) consistent with the intent of NFPA 25, either replace the sprinkler heads prior to reaching their 50-year service life or revise site procedures to perform field service testing, by a recognized testing laboratory, of representative samples from one or more sample areas. (Subsequent testing will be performed on a representative sample at an interval of 10 years after the initial field service testing.)	A.1.1.14	Prior to the period of extended operation	Fire Water System Program LRA Section B.2.14, RAI B.2.14-1

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10	The Aboveground Steel Tanks Program is a new program to be implemented.	A.1.1.15	Prior to the period of extended operation	Aboveground Steel Tanks Program LRA Section B.2.15
11	The Program will be enhanced to: (1) adjust the inspection frequency for the Diesel-Driven Emergency Feedwater Pump Fuel Oil Storage Tank to ensure an inspection is performed prior to the period of extended operation, (2) inspect the internal surfaces of the Diesel-Driven Fire Pump Fuel Oil Storage Tanks, and (3) develop a work activity to periodically inspect the internal surfaces of the Diesel-Driven Fire Pump Fuel Oil Storage Tanks.	A.1.1.16	Prior to the period of extended operation	Fuel Oil Chemistry Program LRA Section B.2.16
12	The Program will be enhanced to: (1) ensure that neutron exposure conditions of the reactor vessel remain bounded by those used to project the effects of embrittlement to the end of the 60-year extended license period and (2) establish formalized controls for the storage of archived specimens to ensure availability for future use by maintaining the identity, traceability, and recovery of the archived specimens throughout the storage period.	A.1.1.17	Prior to the period of extended operation	Reactor Vessel Surveillance Program LRA Section B.2.17
13	The One-Time Inspection Program is a new program to be implemented.	A.1.1.18	Prior to the period of extended operation	One-Time Inspection Program LRA Section B.2.18
14	The Selective Leaching of Materials Program is a new program to be implemented.	A.1.1.19	Prior to the period of extended operation	Selective Leaching of Materials Program LRA Section B.2.19
15	The Buried Piping and Tanks Inspection Program is a new program to be implemented.	A.1.1.20	Prior to the period of extended operation	Buried Piping and Tanks Inspection Program LRA Section B.2.20

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16	Program administrative controls will be revised to incorporate periodic volumetric examinations of ASME Code Class 1 small-bore socket welds. The total number of socket welds selected for examination will be at least 10% of the total population per interval. The examinations will detect and size discontinuities within the specified examination volume, and will begin at such time as an acceptable nuclear industry methodology for nondestructive socket weld examination becomes available. A destructive examination may be performed on an opportunistic basis in lieu of the socket weld volumetric examinations.	A.1.1.1	Prior to the period of extended operation	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program LRA Section B.2.1, RAI B.2.21-3
17	The Program will be enhanced to: (1) incorporate measures to assure the integrity of surfaces that are inaccessible or not readily visible during both plant operations and refueling outages, and (2) incorporate inspection attributes for degradation of coatings.	A.1.1.22	Prior to the period of extended operation	External Surfaces Monitoring Program LRA Section B.2.22, RAI B.2.22-1
18	The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program is a new program to be implemented.	A.1.1.23	Prior to the period of extended operation	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program LRA Section B.2.23
19	Program administrative controls will be enhanced to (1) identify the structures that have masonry walls in the scope of License Renewal, and (2) include inspection of the masonry walls in the Machine Shop in a periodic engineering activity (PMID).	A.1.1.29	Prior to the period of extended operation	Masonry Wall Program LRA Section B.2.29 RAI 2.2-06

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20	Program will be enhanced by revising the administrative controls that implement the Program to: (1) identify all License Renewal structures and systems that credit the Program for aging management in the corporate procedure for condition monitoring of structures, (2) require notification of the responsible engineer when below grade concrete including concrete pipe is exposed so an inspection may be performed prior to backfilling, (3) require periodic groundwater chemistry monitoring including consideration for potential seasonal variations, (4) require periodic inspections of the water control structures, i.e., Circulating Water Intake Structure, Circulating Water Discharge Structure, Nuclear Service Sea Water Discharge Structure, Intake Canal, and Raw Water Pits, on a frequency not to exceed five years, (5) require periodic inspections of the Circulating Water Intake Structure submerged portions on a frequency not to exceed five years, (6) identify additional civil/structural commodities and associated inspection attributes and performance standard required for License Renewal in the corporate procedure for condition monitoring of structures, (7) identify additional inspection criteria for structural commodities in the site system walkdown checklist, (8) add inspection of corrosion to the inspection criteria for the bar racks at the Circulating Water Intake Structure as a periodic maintenance activity, (9) add an inspection of the earth for loss of form and loss of material for the Wave Embankment Protection Structure as a periodic maintenance activity, (10) include additional in-scope structures and specific civil/structural commodities in periodic engineering activities, (11) require periodic inspections of the Fluorogold slide bearing plates used in structural steel platform applications in the Reactor Building., and (12) require periodic inspection of structures on a frequency of at least once every five years.	A.1.1.30	Prior to the period of extended operation	Structures Monitoring Program LRA Section B.2.30, RAI B.2.13-2.1

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21	The Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program is a new program to be implemented.	A.1.1.31	Prior to the period of extended operation	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program LRA Section B.2.31
22	The Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits Program is a new program to be implemented.	A.1.1.32	Prior to the period of extended operation	Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits Program LRA Section B.2.32
23	The Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program is a new program to be implemented.	A.1.1.33	Prior to the period of extended operation	Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program LRA Section B.2.33
24	The Metal Enclosed Bus Program is a new program to be implemented.	A.1.1.34	Prior to the period of extended operation	Metal Enclosed Bus Program LRA Section B.2.34

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25	The Fuse Holder Program is a new program to be implemented.	A.1.1.35	Prior to the period of extended operation	Fuse Holder Program LRA Section B.2.35
26	The Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program is a new program to be implemented.	A.1.1.36	Prior to the period of extended operation	Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program LRA Section B.2.36
27	Administrative controls for the Program will be enhanced to: (1) include provisions to monitor and trend data for incorporation in test procedures to ensure the projection meets the acceptance criteria, (2) incorporate acceptance criteria tables for accumulated weight losses of monitored Carborundum samples, and (3) implement periodic Boron-10 Areal Density Gauge for Evaluating Racks (BADGER) testing or comparable neutron attenuation testing for racks in Pools A and B to ensure that the neutron absorption intended function is maintained, and that technical specification criticality requirements are continually met.	A.1.1.37	Prior to the period of extended operation	Fuel Pool Rack Neutron Absorber Monitoring Program LRA Section B.2.37, RAI 3.3.2.2.6-2, RAI B.2.37-2
28	The High-Voltage Insulators in the 230KV Switchyard Program is a new program to be implemented.	A.1.1.38	Prior to the period of extended operation	High-Voltage Insulators in the 230KV Switchyard Program LRA Section B.2.38

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29	Administrative controls for the Program will be revised to: (1) enhance procedures and activities credited for performance of physical inspections to reflect that inspections of components exposed to closed-cycle cooling water will be performed as made available on an opportunistic basis, (2) flag procedures and activities credited with performance monitoring of parameters in the Instrument Air and Secondary Services Closed Cycle Cooling Water Systems to assure pump and heat exchanger performance are identified as license renewal activities, and (3) flag procedures associated with closed cycle cooling water chemistry controls to identify chemistry controls associated for in-scope systems as License Renewal activities.	A.1.1.11	Prior to the period of extended operation	Closed-Cycle Cooling Water System Program LRA Section B.2.11, RAI B.2.11-1, RAI B.2.11-2
30	Implementing procedures for the Program will be enhanced to ensure compliance with the requirements in NUREG-1801, Revision 1, Section XI.M19.	A.1.9	Prior to the period of extended operation	Steam Generator Tube Integrity Program LRA Section B.2.9 RAI B.2.9-2.1