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

October 19, 2010

LICENSEE: Florida Power Corporation

FACILITY: Crystal River Unit 3 Nuclear Generating Plant

SUBJECT: SUMMARY OF TELEPHONE CONFERENCE CALL HELD ON SEPTEMBER 27, 2010, BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION AND FLORIDA POWER CORPORATION, CONCERNING DRAFT REQUEST FOR INFORMATION RELATED TO THE CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT LICENSE RENEWAL APPLICATION

The U.S. Nuclear Regulatory Commission (NRC or the staff) and representatives of Florida Power Corporation (FPC, the applicant) held a telephone conference call on September 27, 2010, to discuss the staffs draft request for additional information (D-RAI) concerning the Crystal River Unit 3 Nuclear Generating Plant (CR-3) license renewal application (LRA). The telephone conference call was useful in clarifying the staffs RAI request.

Enclosure 1 provides a listing of the participants and Enclosure 2 provides a description of the draft RAIs discussed.

The applicant had an opportunity to comment on this summary.

Robert Kuntz, Sr. Project Manager
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-302

Enclosures:
1. List of Participants
2. Description of Draft RAIs discussed

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TELEPHONE CONFERENCE CALL
CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT
LICENSE RENEWAL APPLICATION

LIST OF PARTICIPANTS
September 27, 2010

PARTICIPANTS	AFFILIATIONS
Robert Kuntz	U.S. Nuclear Regulatory Commission (NRC)
Rachel Vaucher	NRC
Mike Heath	Florida Power Corporation (FPC)
Chris Mallner	FPC

ENCLOSURE 1

DRAFT REQUEST FOR ADDITIONAL INFORMATION

LICENSE RENEWAL APPLICATION FOR

CRYSTAL RIVER UNIT 3

DOCKET NO. 50-302

D-RAI 3.31.53-2

Background:

GALL Report Table 3, line items 53 and 54 recommend that steel or stainless steel piping, piping components, and piping elements exposed to condensation should be managed by GALL Report aging management program (AMP) XI.M24, "Compressed Air Monitoring." The applicant stated in the LRA that the GALL Report Table 3, line items 53 and 54 are not applicable to Crystal River Unit 3 thus they did not develope an aging management program to manage aging effects of steel or stainless steel compressed air system piping, piping components, or piping elements exposed to condensation.

By letter dated June 2, 2010, the staff issued request for additional information (RAI) 3.31.53-1 requesting that the applicant identify the Table 2 line items that are credited to manage loss of material for steel compressed air system piping exposed to internal condensation and describe how performance monitoring and air quality aspects of the GALL Report AMP XI.M24 are being considered.

Issue:

In its response, dated June 21, 2010, the applicant stated that components downstream of the compressed air system dryers were considered to be in a dry air environment and therefore not expected to exhibit aging effects. Historically, as discussed in the references included in GALL Report AMP XI.M24, aging effects such as a loss of material have been a contributor to compressed air system failures. Furthermore, the lack of air quality sampling and performance monitoring as described in GALL Report AMP XI.M24 leaves the quality of the dried air downstream of the system dryers in question. The staff believes that an appropriate AMP should be utilized to detect and manage the loss of material aging effect associated with compressed air system components within the scope of license renewal, whether upstream or downstream of compressed air system dryers.

Request:

For compressed air system related piping, piping components, and piping elements identified as being exposed to a "dried air (inside)" environment, describe the AMP to be applied to detect and manage the loss of material due to general, pitting and crevice corrosion aging effects.

Discussion: The applicant indicated that the question is clear. This draft RAI (D-RAI) will be sent as a formal RAI.

ENCLOSURE 2

D-RAI 3.1.2.1-5.1

Background

In its response dated December 30, 2009, to RAI 3.1.2.1-5 about the aging effect of wall thinning due to flow accelerated corrosion for steam generator feedwater and auxiliary feedwater nozzles and safe ends, and steam nozzles and safe ends, the applicant describes the configuration of the main feedwater (MFW) piping and connections and the configuration of the auxiliary feedwater (AFW) piping and connections for its once-through steam generators (OTSG) and states that these configurations are not a standard nozzle and safe end as described in NUREG-1801. The applicant deduces from this configuration difference that the MFW spray nozzle flanges were determined not to be susceptible to flow accelerated corrosion (FAC).

The applicant further stated that, when it performed its plant-specific susceptibility evaluation for the AFW components, it applied the guidance from Section 4.2 of Revision 2 to NSAC-202L, 'Recommendations for an Effective Flow-Accelerated Corrosion Program' for lines that are not normally operated and determined that those components were not susceptible to FAC.

Furthermore, the applicant stated that, still in accordance with NSAC-202L, Revision 2, which excludes "Superheated steam systems or portions of systems with no moisture content, regardless of temperature or pressure levels," the OTSG Steam Outlet Nozzles exposed to superheated steam could be excluded. For these last components, the staff acknowledges that the FAC phenomenon is not a concern.

Lastly, the applicant stated that the susceptibility of the replacement OTSGs to FAC is addressed in its response to RAI B.2.9-6, where it states that it used erosion-corrosion resistant material for all header components.

Issue

Since the GALL Report does not include the description of a "standard" nozzle and safe end, it is not clear to the staff how the applicant's MFW and AFW nozzle and safe end configurations are different from a GALL Report "standard" and what are the consequences of such potential differences on FAC likelihood, especially for the MFW spray nozzle flanges. Moreover, the guidance of NSAC-202L, Revision 2 includes some caution when determining the non-susceptibility to FAC of lines that are not normally operated, such as AFW lines. Based on the information provided by the applicant in its response, it is not clear to the staff why these cautions are not applicable to the AFW piping and connections.

It is also not clear to the staff whether the applicant's response to RAI 3.1.2.1-5 is applicable to its original or replacement SGs. Especially, since in its response to RAI B2.9-6 the applicant stated that the material used for all header components is resistant to erosion-corrosion, it is not clear to the staff what is the basis for the applicant's claim that wall thinning due to FAC for steam generator feedwater and auxiliary feedwater nozzles and safe ends is not an aging effect of concern for its SGs.

Request

Clarify if the response to RAI 3.1.2.1-5 is related to the original or the replacement SGs, especially concerning the resistance to erosion-corrosion of the materials used for all the components related to this RAI.

If the response to RAI 3.1.2.1-5 is related to your replacement SGs:

1) Clarify what is considered the "GALL standard" nozzle configuration, and justify why the differences between the replacement SGs configurations and such a "GALL standard" configuration preclude wall thinning due to FAC for the MFW and AFW components that have been identified as not susceptible to FAC.

2) Justify why the cautions of Section 4.2 of NSAC-202L, Revision 2, concerning the exclusion from FAC evaluation of lines that are not normally operated, are not applicable to AFW lines.

Discussion: The applicant clarified during the teleconference that the information presented in the response to RAI 3.1.2.1-5 related to the steam generators that have been replaced. Therefore, this draft RAI will not be sent as a formal RAI.

D-RAI 3.1.2.1-6.1

Background

In its response dated December 30, 2009 to RAI 3.1.2.1-6 about the aging effect of reduction of heat transfer effectiveness due to fouling from the inside (primary) surfaces for nickel-alloy steam generator tubes and sleeves, the applicant explained that although there is no plant-specific operating experience (OE) related to reduction of heat transfer effectiveness due to fouling of heat transfer surfaces on either the primary and secondary sides of the steam generator tubes, its aging management review methodology assumes the aging effect is applicable in the absence of water chemistry control. The applicant stated that its aging management strategy will be updated to delete the reliance on the Steam Generator Tube Integrity Program and that the reduction of heat transfer effectiveness due to fouling of heat transfer surfaces of the primary and secondary sides of the tubes will be managed by the Water Chemistry Program only.

The applicant further stated that the GALL Report recommends the use of the Water Chemistry Program for managing corrosion on the primary side similarly for stainless steel and nickel base alloys and for managing reduction of heat transfer due to fouling of stainless steel heat exchanger tubes. Therefore, the applicant considers that the use of the Water Chemistry Program to manage nickel base alloy heat exchanger tubes for this aging effect is acceptable.

The staff noted that the GALL Report states that for stainless steel heat exchanger tubes exposed to treated water, control of water chemistry may have been inadequate, and recommends that the effectiveness of the chemistry control program should be verified to ensure that reduction of heat transfer due to fouling is not occurring.

Even though it has not been observed in applicant's SGs, the staff also noted that, there is well-known OE for the aging effect of reduction of heat transfer due to fouling of the SG tubes secondary surface, as identified in NRC Information Notice 2007-37.

Issue

It is not clear to the staff why the applicant modified its application by selecting only the Water Chemistry Program, without any effectiveness verification program for managing this aging effect, and does not use the Steam Generator Tube Integrity Program. The Steam Generator Tube Integrity Program includes secondary activities related to fouling, consistent with industry guidelines, such as EPRI PWR Water Chemistry Guidelines and NEI 97-06, "Steam Generator Program Guidelines," as recommended in GALL AMPs XI.M2 and XI.M19. The staff considers that the Steam Generator Tube Integrity Program serves as a water chemistry effectiveness verification program, consistent with the recommendations of the GALL Report and SRP-LR.

Request

Justify the elimination of the Steam Generator Tube Integrity Program for verifying the effectiveness of the Water Chemistry Program in managing the aging effect of reduction of heat transfer due to fouling on the SG tube external surfaces, or revise your application to include this program, to verify the effectiveness of the Water Chemistry Program, consistent with the recommendations of the GALL Report.

Discussion: The applicant indicated that the question is clear. This D-RAI will be sent as a formal RAI.

D-RAI B.2.33-1

Background:

NUREG-1801, Rev. 1, "Generic Aging Lessons Learned," (the GALL Report) addresses inaccessible medium-voltage cables in Aging Management Program (AMP) XI.E3, "Inaccessible Medium-Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements." The purpose of this program is to provide reasonable assurance that the intended functions of inaccessible medium-voltage cables (2 kV to 35 kV), that are not subject to environmental qualification requirements of 10 CFR 50.49 and are exposed to adverse localized environments caused by moisture while energized, will be maintained consistent with the current licensing basis. The scope of the program applies to inaccessible (in conduits, cable trenches, cable troughs, duct banks, underground vaults or direct buried installations) medium-voltage cables within the scope of license renewal that are subject to significant moisture simultaneously with significant voltage.

The application of GALL AMP XI.E3 to medium-voltage cables was based on the operating experience available at the time Revision 1 of the GALL Report was developed. However, recently identified industry operating experience indicates that the presence of water or moisture can be a contributing factor in inaccessible power cables failures at lower service voltages (480 V to 2 kV). Applicable OE was identified in licensee responses to Generic Letter (GL) 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident

Mitigation Systems or Cause Plant Transients," which included failures of power cable operating at service voltages of less than 2 kV where water was considered a contributing factor.

Recently identified industry operating, provided by NRC licensees in response to GL 2007-01 has shown that there is an increasing trend of cable failures with length in service beginning in the sixth through tenth years of operation and also that moisture intrusion is the predominant factor contributing to cable failure. The staff has determined, based on the review of the cable failure distribution, that annual inspection of manholes and cable testing frequency of at least every 6 years is a conservative approach to ensuring the operability of power cables and, therefore, should be considered.

In addition, recently identified industry operating experience has shown that some NRC licensees may experience events, such as flooding or heavy rain, that subject cables within the scope of program for GALL Report AMP XI.E3 to significant moisture. The staff has determined that event driven inspections, in addition to a 1 year periodic inspection frequency, is a conservative approach and, therefore, should be considered.

Issue:

The staff has concluded, based on recently identified industry operating experience concerning the failure of inaccessible low-voltage power cables (480 V to 2 kV) in the presence of significant moisture, that these cables can potentially experience age related degradation. The staff noted that the applicant's Inaccessible Medium-Voltage Cables Program does not address inaccessible low-voltage power cables (400 V (Nominally 480 V) to 2 kV inclusive). In addition, increased cable test and inspection frequencies (6 and 1 years respectively) should be evaluated to ensure that the Inaccessible Medium-Voltage Cable Program test and inspection frequencies reflect industry and plant-specific operating experience and that test and inspection frequencies may be increased based on future industry and plant-specific operating experience.

Request:

1) Provide a summary of your evaluation of recently identified industry operating experience and any plant-specific operating experience concerning inaccessible low-voltage power cable failures within the scope of license renewal (not subject to 10 CFR 50.49 environmental qualification requirements), and how this operating experience applies to the need for additional aging management activities at your plant for such cables.

2) Provide a discussion of how CR-3 will manage the effects of aging on inaccessible low-voltage power cables within the scope of license renewal and subject to aging management review; with consideration of recently identified industry operating experience and any plant-specific operating experience. The discussion should include assessment of your aging management program description, program elements (i.e., Scope of Program, Parameters Monitored/Inspected, Detection of Aging Effects, and Corrective Actions), and FSAR summary description to demonstrate reasonable assurance that the intended functions of inaccessible low voltage power cables subject to adverse localized environments will be maintained consistent with the current licensing basis through the period of extended operation.

3) Provide an evaluation showing that the Inaccessible Medium Voltage Cable Program test and inspection frequencies, including event driven inspections, incorporate recent industry and plant-specific operating experience for both inaccessible low- and medium-voltage cable. Discuss how the Inaccessible Medium Voltage Cable Program will ensure that future industry and plant-specific operating experience will be incorporated into the program such that inspection and test frequencies may be increased based on test and inspection results.

Discussion: The applicant indicated that the question is clear. This D-RAI will be sent as a formal RAI.

October 19, 2010

LICENSEE: Florida Power Corporation

FACILITY: Crystal River Unit 3 Nuclear Generating Plant

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Letter to Florida Power Corporation from Robert Kuntz dated October 19, 2010.

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