



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

May 26, 2011

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

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE
CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT, LICENSE
RENEWAL APPLICATION (TAC NO. ME0274)

Dear Mr. Franke:

By letter dated December 16, 2009, Florida Power Corporation submitted an application pursuant to Title 10 of the *Code of Federal Regulations Part 54*, to renew the operating license for Crystal River Unit 3 Nuclear Generating Plant (CR-3), for review by the U.S. Nuclear Regulatory Commission (NRC or the staff). The staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete the review. Further requests for additional information may be issued in the future.

Items in the enclosure were discussed with Mr. Michael Heath, and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact me at 301-415-3733 or by e-mail at robert.kuntz@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Kuntz", written over a faint circular stamp.

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

Docket No. 50-302

Enclosure:
As stated

cc w/encl: Listserv

REQUEST FOR ADDITIONAL INFORMATION
LICENSE RENEWAL APPLICATION FOR
CRYSTAL RIVER UNIT 3 NUCLEAR GENERATING PLANT
DOCKET NO: 50-302

RAI 3.3.2.2.4-2

Background

NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants," (SRP-LR) Section 3.3.2.2.4, "Cracking due to Stress Corrosion Cracking and Cyclic Loading," item 1 recommends further evaluation of stainless steel non-regenerative heat exchanger components exposed to high temperature treated borated water in the chemical and volume control system. This section of the SRP-LR states that the effectiveness of the water chemistry control program should be verified to ensure cracking is not occurring and adds that an acceptable verification program includes temperature and radioactivity monitoring of the shell side water and eddy current testing of the tubes.

License renewal application (LRA) Table 3.3.2-42, "Make Up & Purification System," states that stainless steel components exposed to high temperature treated water in the letdown coolers are being age managed for cracking due to stress corrosion cracking and cyclic loading by item 3.3.1-7 and the further evaluation section 3.3.2.2.4 item 1. However, stainless steel components exposed to high temperature treated water in the Make Up & Purification System seal return coolers are being age managed by item 3.3.1-90, which does not require the performance of further evaluation section 3.3.2.2.4 item 1.

Issue

It is not clear to the staff why the Make Up & Purification System letdown coolers and seal return coolers are age managed differently given that these coolers are contained in the same system, constructed of the same material, and presumably share common environments and aging effects. Specifically, it is not clear how this item would otherwise address the management of cracking due to stress corrosion cracking and cyclic loading.

Request

Address how this item would otherwise verify the Water Chemistry Control Program's effectiveness to manage cracking due to stress corrosion cracking and cyclic loading. Additionally, address the basis for not performing eddy current testing.

ENCLOSURE

RAI B.3.3-1

Background

NUREG-1801, "Generic Aging Lessons Learned (GALL) Report" aging management program (AMP) X.S1, "Concrete Containment Tendon Prestress," states that the existing prestressing forces in the containment tendon should not be below the Minimum Required Value (MRV) or the minimum required prestressing force prior to the next scheduled inspection, as required by 10 CFR 50.55a(b)(2)(viii)(B).

Issue

During the audit the staff reviewed the program basis and implementation documents for the applicant's AMP, "Concrete Containment Tendon Prestress Program." In these documents, the MRV, for the dome, vertical, and hoop tendons, is noted as 1215 Kips, 1149 Kips, and 1252 Kips respectively. However, as a result of concrete delamination found during the hydro-demolition of the reactor building wall for steam generator replacement in 2009, all of the vertical and more than half of the hoop tendons have to be retensioned. In addition, the concrete containment has been reanalyzed and MRV for prestressing tendons revised.

Request

Provide the revised MRVs for dome, hoop, and vertical tendons. In addition, provide plans and schedule for revising the affected the portions of the program basis and implementation documents for the Concrete Containment Tendon Prestress Program AMP.

RAI B.3.3-2

Background

GALL AMP X.S1 recommends that the estimated and measured prestressing forces be plotted against time, and the predicted lower limit (PLL), MRV, and trending lines are developed for the period of extended operation. NRC Regulatory Guide (RG) 1.35.1 "Determining Prestressing Forces for Inspection of Prestressed Concrete Containments" provides guidance for calculating PLL and MRV. The trend line represents the trend of prestressing forces based on the actual measured forces. NRC Information Notice, IN 99-10 provides guidance for constructing the trend line.

Issue

In a letter dated December 8, 2010, the applicant, in response to request for additional information (RAI) number RAI 4.5.1-1, stated that regression analyses and log-linear trend plots for the re-tensioned vertical and hoop tendons will be performed as a part of the Concrete Containment Tendon Prestress Program prior to the period of extended operation. In addition, in a letter dated February 25, 2011, the applicant provided a schedule for performing surveillance of the re-tensioned vertical and hoop tendons. According to this schedule, the

applicant plans to perform surveillance of the hoop and the vertical tendons only once (during 2011-2012) prior to the period of extended operation.

Request

Provide details on how the regression analyses and log-linear trend plots for the re-tensioned vertical and hoop tendons will be performed using data collected during only one surveillance prior to period of extended operation.

RAI B.3.3-3

Background

In response to RAI 4.5.1-1, the applicant stated that as a result of concrete delamination found during the hydro-demolition of the reactor building wall for steam generator replacement in 2009, all of the vertical and more than half of the hoop tendons have to be retensioned. The applicant further stated that time dependent losses were used in the calculation for concrete creep, concrete shrinkage, and prestressing steel relaxation. Updated values were used for creep based on original concrete used at Crystal River Unit 3 Nuclear Generating Plant (CR-3). For subsequent surveillances of the vertical tendons and re-tensioned hoop tendons, individual predicted tendon prestress will be calculated in a similar manner.

Issue

Retensioning of all of the vertical and more than half of the hoop tendons will affect the forces in the dome and the undisturbed hoop tendons. In addition, the trend lines previously developed for the undisturbed dome and hoop tendons are not based on updated values of concrete creep. Documents reviewed by the staff during the audit indicate that the applicant plans to use the previously calculated trend lines for the dome and undisturbed hoop tendons.

Request

Explain why the previously calculated trend lines for the dome and undisturbed hoop tendons are acceptable for use during the future surveillances. In addition, describe how two sets of hoop tendons (re-stressed and undisturbed) will be considered for surveillances during the period of extended operation since the MRV and trend lines for the two sets of hoop tendons may be different. Will the two sets of hoop tendons (re-stressed and undisturbed) be treated as two different tendon groups for future surveillances during the period of extended operation?

RAI B.3.3-4

Background

GALL AMP X.S1 program consists of an assessment of inspections performed in accordance with the requirements of Subsection IVL of the American Society of Mechanical Engineers (ASME) Code, Section XI, as supplemented by the requirements of 10 CFR 50.55a(b)(2)(viii). ASME Section XI, Subsection IVL, Article IVL-2521 states, "one tendon of each type (as

defined in Table IWL-2521-1) shall be selected from the first year inspection sample and designated as a common tendon. Each common tendon shall be examined during each inspection. A common tendon shall not be detensioned unless required by IWL-3300; and if a common tendon is detensioned, another common tendon of the same type shall be selected from the first year inspection sample.”

Issue

As a result of concrete delamination found during the hydro-demolition of the reactor building wall for steam generator replacement in 2009, all of the vertical and more than half of the hoop tendons have to be retensioned. These retensioned tendons include the common vertical tendon and may also include common hoop tendon.

Request

Provide information on how common hoop and vertical tendons will be selected since all of the vertical and more than half of the hoop tendons have been retensioned due to concrete delamination found during the hydro-demolition of the reactor building wall for steam generator replacement in 2009.

May 26, 2011

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Sincerely,

/RA/

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

Docket No. 50-302

Enclosure:
As stated

cc w/encl: Listserv

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ADAMS Accession Number: ML11122A000

*concurrence via email

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NAME	YEdmonds	RKuntz	DWrona	RKuntz
DATE	05/12/2011	05/24/2011	05/25/2011	05/26/2011

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