Progress Energy

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

Ref: 10 CFR 50.55a

November 25, 2009
3F1109-02

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

Subject: Crystal River Unit 3 – Response to Request for Additional Information Related to Relief Request 09-004-II, Revision 0 (TAC NO. ME2606)

References: (1) CR-3 to NRC letter, 3F1109-07, dated November 13, 2009, "Crystal River Unit 3 – Relief Request (RR) 09-004-II, Revision 0

(2) NRC to CR-3 Electronic Mail, dated November 18, 2009, Request for Additional Information Related to Relief Request 09-004-II, Revision 0 (TAC NO. ME2606)

Dear Sir:

On November 13, 2009, Florida Power Corporation (FPC), doing business as Progress Energy Florida, Inc. (PEF), submitted Relief Request 09-004-II, Revision 0. This relief request is associated with the bare-metal inspection criteria specified in 10 CFR 50.55a(g)(6)(ii)(E)(1) and ASME Code Case N-722, Note (3.a), for the inspection of the Reactor Pressure Vessel (RPV) bottom-mounted nozzles (Reference 1). Subsequently, the Nuclear Regulatory Commission (NRC), by electronic mail dated November 18, 2009, provided a request for additional information (RAI) concerning Crystal River Unit 3 (CR-3) Relief Request 09-004-II, Revision 0 (Reference 2). The Enclosure to this letter provides the response to Reference 2.

In Reference 1, FPC requested approval of Relief Request 09-004-II, Revision 0, by December 10, 2009. At the time of submission, CR-3 was in Refueling Outage 16 (R16) and was scheduled to enter Operational Mode 4 on December 17, 2009. In light of the NRC Public Meeting held on November 20, 2009, to discuss the CR-3 Reactor Building concrete delamination, a new schedule for exiting R16 is being developed. Therefore, FPC is now requesting approval of Relief Request 09-004-II by January 20, 2009.

No new regulatory commitments are contained in this submittal.

If you have any questions regarding this submittal, please contact Mr. Dan Westcott, Superintendent, Licensing & Regulatory Programs at (352) 563-4796.

Sincerely,

Stephen J. Cahill
Manager Engineering
Crystal River Unit 3

SJC/dwh

Enclosure: Response to Request for Additional Information

xc: NRC CR-3 Project Manager
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Senior Resident Inspector

A047
NRR

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CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

ENCLOSURE

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

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The staff reviewed the relief request and requests that the licensee address the following issues:

Request for Additional Information (RAI) - a.

Bin the total number of bottom-mounted instrumentation (BMI) nozzles into the following categories:

(1) The number of nozzles with paint that bridges the nozzle annulus around the entire circumference of the nozzle.

(2) The number of nozzles with paint that bridges the nozzle annulus around the part of the circumference of the nozzle. For these nozzles, provide an estimate of the amount of the nozzle annulus (as a percent) which is obstructed for each nozzle.

(3) The number of nozzles without any paint obstructing the view of the nozzle annulus.

Response

There are a total of fifty-two (52) bottom-mounted instrument (BMI) nozzles located at the bottom of the Crystal River Unit 3 (CR-3) Reactor Pressure Vessel (RPV).

(1) No BMI nozzles were identified with paint that bridges the nozzle annulus around the entire circumference of the nozzle.

(2) Three (3) BMI nozzles were identified with paint that bridges the nozzle annulus around part of the circumference between the RPV bottom head surface and the nozzle. For these three nozzles, less than 15% of the nozzle annulus is obstructed for each nozzle. The nozzles are identified by Video Time (11:08, 11:20 and 13:12), corresponding to the inspection DVD previously provided to both the NRC Project Manager and NRC Region II personnel.

(3) Forty-nine (49) of the BMI nozzles did not have any paint obstructing the view of the nozzle annulus. The nozzle annulus can be identified for all 52 nozzles.

RAI - b.

Clarify whether the inspectors were trained in identifying a bulge in the paint which could be the result of a reactor coolant system leak.

Response

The VT-2 inspectors were trained in identifying multiple characteristics of boric acid leakage during the four hour training session that was provided prior to performing the BMI nozzle inspection. Among the characteristics discussed were bulges and blistering through painted surfaces. The training session was primarily developed to reinforce Code Cases N-722 and N-

729, and Nuclear Generation Group Engineering Procedure EGR-NGGC-0207, "Boric Acid Corrosion Control."

RAI - c.

Provide a discussion of how visual examination or leak detection provides a basis for ensuring that circumferential primary water stress corrosion cracking is not occurring on the outside diameter of the Alloy 600 nozzles, if the annulus is plugged and occluded by paint.

Response

The paint first observed in the 2003 BMI inspection was found to be brittle and flaked. After approximately thirty-two (32) years of operation, there is reasonable assurance that any paint in and over the annulus will not offer significant resistance to pressure from Reactor Coolant System (RCS) leakage into the annulus and the resultant growth of boric acid deposits. The likelihood of paint preventing the passage of leakage and boric acid deposits (paint is not an approved pressure boundary material) is extremely low.

The current condition of the RPV bottom head was visually compared with the condition of the pressurizer in 2003, when leakage was detected from three steam space penetrations (Licensee Event Report 50-302/03-003-00, Accession Number ML033320052). The configuration of the RPV BMI nozzle penetrations is similar to the penetration configuration in the pressurizer (that is, a J-groove weld on the inner diameter (ID) of the pressurizer shell). The original construction requirement to paint the carbon steel surfaces was the same for the pressurizer as for the RPV (one coat of high-heat paint). The original paint on the pressurizer was in place, much more so than the RPV, but was clearly degraded by evidence of cracking. Evidence of small amounts of leakage was clearly discernible at all three locations. By comparison, since the mass flow from leakage in the steam space in the pressurizer is significantly less than the mass flow from leakage in the RPV water space, the likelihood of aged and brittle paint impeding leakage products from the BMI nozzle for any significant time is extremely low.

Therefore, CR-3 concludes that the likelihood of Outer Diameter Primary Water Stress Corrosion Cracking in a penetration, in which the annulus is covered by paint, is no more than in a penetration with an annulus not covered by paint. The resultant visual indications of leakage would be present in either case.

RAI - d.

Confirm whether any evidence of reactor cavity seal leakage, during the past refueling outages, was identified in the vicinity of the BMI nozzles. If so, what methods or criteria were used to disposition this reactor cavity seal leakage as not being evidence of leakage from the BMI nozzles.

Response

No evidence of reactor cavity seal leakage was identified in the vicinity of the BMI nozzles during past refueling outages.

The design of the RPV support skirt makes it unlikely that cavity seal leakage would reach the under vessel area, including the BMI nozzles. The support skirt is welded around the entire base of the RPV.

The Operations Department performs a RCS water inventory balance on a daily basis during steady state operations in accordance with Surveillance Procedure SP-317, "RC System Water Inventory Balance." This procedure takes into account changes in the Reactor Building (RB) sump rate of rise and a verification of the source of any leakage, should there be a statistically significant increase in RCS leakage. For the detailed RB inspection, the method proceduralized is to observe the RB sump inlet flow. The area of the RB below the RPV and incore nozzles has a dedicated four inch drain line that runs from the incore trench area directly to the RB sump, with no branching. This facilitates a direct observation of leakage from the under vessel area with the plant on line.

CR-3 is currently implementing a design change for the Nuclear Instrumentation (NI) cover plates in the bottom of the refueling cavity to improve the sealing surface. This action will minimize/eliminate this potential leak path. Previous leaks from the NI cover plates have occurred, but have travelled via NI conduits to emerge at a location well removed from the RPV bottom head, and have not impacted the BMI nozzles.