Progress Energy

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

Ref: 10 CFR 50.55a

May 27, 2009
3F0509-06

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

Subject: Crystal River Unit 3 – Response to Request for Additional Information Regarding Relief Request 09-001-IT for the Inservice Testing Program (TAC NO. ME0987)

References:
1. NRC to Crystal River Unit 3 letter dated May 8, 2009, "Crystal River Unit 3 - Request for Additional Information Regarding Relief Request 09-001-IT for the Inservice Testing Program (TAC NO. ME0987)"
2. Crystal River Unit 3 to NRC letter dated March 20, 2009, "Crystal River Unit 3 – Relief Request #09-001-IT, Revision 0"

Dear Sir:

Pursuant to 10 CFR 50.55a(a)(3)(i), Florida Power Corporation (FPC), doing business as Progress Energy Florida, Inc., is hereby submitting the Crystal River Unit 3 (CR-3) response to the Nuclear Regulatory Commission (NRC) request for additional information (RAI) received by letter dated May 8, 2009 (Reference 1). This request for additional information is based on the NRC review of CR-3 Relief Request #09-001-IT, Revision 0 (Reference 2).

No regulatory commitments are contained within this submittal.

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

Sincerely,

R. W. Dermann for S.J. CAHILL

Stephen J. Cahill
Manager, Engineering
Crystal River Nuclear Plant

SJC/dwh

Attachment: Response to Request for Additional Information

xc: NRR Project Manager
Regional Administrator, NRC Region II
Senior Resident Inspector

A047
NRR

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

PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

ATTACHMENT

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

RAI 09-001-IT-001

Please identify pumps in Section 1.0 of your request that are classified as Group A pumps and pumps that are classified as Group B pumps. Provide your rationale for reclassifying the pumps, if you are proposing to reclassify any pump from Group B to Group A.

CR-3 Response

The pumps listed in Section 1.0 are being classified as Group A pumps in the Fourth Ten-Year Interval Inservice Test (IST) Program. Pumps BSP-1A, BSP-1B, EFP-3, RWP-2A, RWP-2B, SWP-1A, and SWP-1B could be classified as Group B pumps since they are not operated routinely, except for testing. However, these pumps are being classified as Group A pumps in the Fourth Ten-Year Interval IST Program because they are capable of meeting their design flow rates for quarterly testing. The data that is collected during a quarterly Group A pump test provides more information about the pump and its condition than the data collected quarterly by a Group B pump test.

In accordance with ISTB-1400, Paragraph (b), it is the owner's responsibility to categorize pumps as either a Group A pump or a Group B pump. When a pump meets both Group A and Group B definitions, the pump shall be categorized as a Group A pump. This supports the conclusion that the Group A pump test is more indicative of actual pump performance than the Group B pump test.

In addition, categorizing the Group B pumps as Group A pumps allows Crystal River Unit 3 (CR-3) to use the same relief request to address the entire population of pumps that can be operated at their design flow rate for quarterly testing.

RAI 09-001-IT-002

The proposed alternative replaces the comprehensive test acceptable ranges (0.93 – 1.03 for differential (Δ) pressure for centrifugal pumps and 0.95 – 1.03 Δ pressure for vertical line shaft centrifugal pumps) with wider and less conservative acceptance ranges (0.90 – 1.06 for Δ pressure). The Alert Range is also eliminated. Please explain how these changes will provide an acceptable level of quality and safety.

CR-3 Response

The acceptable range of 0.90 to 1.06 differential (Δ) pressure is only intended to be used for the proposed modified Group A testing of the centrifugal pumps that are not defined as vertical line shaft pumps. The acceptance criteria and Alert Range for hydraulic performance parameters of the modified quarterly testing for the vertical line shaft centrifugal pumps is intended to be the same as that prescribed for a typical Group A vertical line shaft pump with the exception of the upper end of the acceptable range value, which is being proposed at 1.06 Δ pressure (i.e., the acceptable range would be 0.95 to 1.06 Δ pressure, and the Alert Range would be 0.93 to < 0.95 Δ pressure).

The increased accuracy instrument (i.e., 0.5%) used during all quarterly pump tests, coupled with the fact that the tests are being performed at the design flow rate, provides the additional

level of quality and safety necessary to expand the acceptable ranges for the quarterly test to 0.90 to 1.06 Δ pressure for centrifugal pumps and 0.95 to 1.06 Δ pressure for vertical line shaft centrifugal pumps.

The purpose of the testing program is to gather information about the health of the components, trend that information, and take actions to prevent that component from degrading to a point where it can no longer perform its intended function. Taking more accurate data at a flow rate where degradation is more easily identifiable, on a quarterly frequency, provides a licensee the ability to more accurately trend for degradation. Maintenance can then be planned and performed at an appropriate time, rather than at a point where the component is no longer capable of performing its intended function. While the acceptable ranges are wider than those prescribed by the code, the heightened ability to trend for degradation provides the acceptable level of quality and safety.

In addition, there are several factors that make the upper acceptable range of 1.03 times the reference for Δ pressure unnecessarily restrictive; one of which is the instrument inaccuracy of measuring hydraulic values. If flow is set and Δ pressure or pressure is measured, up to 1.5% of the current 3% band may be eliminated based on the Code allowed pressure instrument inaccuracies. ISTB-3510(a) and Table ISTB-3500-1 currently require analog pressure instrumentation for the Comprehensive Pump Test to meet ± 0.5% of full scale. Based on ISTB-3510(b)(1), the full scale range of each analog instrument shall not be greater than three times the reference value. Therefore, the existing Code allows the measured Δ pressure or pressure reference value to have instrument inaccuracies of up to ± 1.5% of the reference value. A similar discussion is addressed within NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants, Revision 1, Final Report for Preliminary Review and Comment," Section 5.5.1. The instrument inaccuracies of the set value and its affect on the measured value must be considered. If flow is being set, the reference set flow value may have instrument inaccuracies of up to ± 6%. This allowed amount of inaccuracy for the set flow value for a Comprehensive Pump Test that is performed at a point well out on the sloped portion of the pump curve would have a significant impact on the measured Δ pressure value. The impact would vary from pump to pump, but this factor may jeopardize or exceed the current upper ± 3% criteria that would be applied to the measured Δ pressure value. The Code does not explicitly require the licensee to consider physical attributes (e.g., orifice plate tolerances), tap locations, environmental effects (e.g., temperature, radiation or humidity), vibration effects (e.g., seismic) or process effects (e.g., temperature). However, these factors may impact the accuracy of the measured hydraulic characteristics as well.

Expanding the lower acceptable range on the Comprehensive Pump Test to the lower acceptable range of the Group A test eliminates the Alert Range for Δ pressure for centrifugal pumps, excluding vertical line shaft centrifugal pumps. However, should a Δ pressure fall into the alert range during the Comprehensive Pump Test, action would be taken to perform the Comprehensive Pump Test on an increased frequency (annually). This increased frequency would be less frequent than the quarterly testing being proposed, thus providing increased quality and safety.

RAI 09-001-IT-003

ISTB-5000, "Specific Testing Requirements," allows substituting a comprehensive test for a Group A test. Explain why a comprehensive test cannot be performed quarterly in lieu of Group A tests, if the quarterly Group A test can be performed within ± 20 percent of the pumps design flow rate using pressure instruments with ± ½ percent accuracy.

CR-3 Response

This would be possible, yet the acceptance criteria for a comprehensive test are unnecessarily restrictive for use during a quarterly test. The Comprehensive Pump Test acceptance criteria were developed to detect degradation and prevent a licensee from allowing a component to degrade to a point near failure without taking action to address the problem before the component fails during a test that would not occur again for two years. The quarterly testing approach requires more frequent testing at design flow and allows better trending of a degrading component. This allows the licensee to prepare appropriate corrective actions well before the component has degraded to a point that challenges the components ability to perform its design function.