



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

March 15, 2010

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

SUBJECT: CRYSTAL RIVER NUCLEAR PLANT, UNIT NO. 3 - RELIEF  
REQUEST 09-001-IT, REVISION 0, PROPOSED ALTERNATIVE FOR  
COMPREHENSIVE PUMP TEST (TAC NO. ME0987)

Dear Mr. Franke,

By letter dated March 30, 2008, as supplemented by letter dated May 27, 2009, Florida Power Corporation (the licensee) submitted Relief Request (RR) 09-001-IT, Revision 0 proposing an alternative to an American Society of Mechanical Engineers (ASME), Code for Operation and Maintenance of Nuclear Power Plants (OM Code) requirement for Crystal River Nuclear Generating Plant Unit 3 (CR-3). Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(i), the licensee requested to use a modified Group A test, in lieu of the ASME OM code-required comprehensive test, for certain pumps in the inservice testing (IST) program at CR-3.

The Nuclear Regulatory Commission (NRC) staff has evaluated the licensee's relief request and found that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(i). The NRC staff has determined that the proposed alternative will provide an acceptable level of quality and safety, therefore pursuant to 10 CFR 50.55a(3)(i), the NRC staff authorizes the use of RR 09-001-IT for the fourth 10-year IST interval, which began on May 11, 2009.

The NRC staff's safety evaluation is enclosed. If you have any questions regarding this matter, please contact Farideh Saba at (301) 415-1447.

Sincerely,

A handwritten signature in black ink, appearing to read "Doug Broaddus".

Douglas A. Broaddus, Acting Chief  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-302

Enclosure: Safety Evaluation

cc w/enclosure: Distribution via ListServ



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

CRYSTAL RIVER UNIT 3 – RELIEF REQUEST 09-001-IT, REVISION 0

ALTERNATIVE FOR COMPREHENSIVE PUMP TEST

FLORIDA POWER CORPORATION

CRYSTAL RIVER NUCLEAR PLANT, UNIT 3

DOCKET NO. 50-302

1.0 INTRODUCTION

By letter dated March 30, 2009, as supplemented by letter dated May 27, 2009, Florida Power Corporation (the licensee), submitted Relief Request (RR) 09-001-IT, Revision 0 to the Nuclear Regulatory Commission (NRC) for the use of an alternative to an American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) requirement for the Crystal River Nuclear Generating Plant Unit 3 (CR-3).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(i), the licensee proposed to perform a modified Group A test on certain pumps in lieu of the ASME OM Code-required comprehensive test on the basis that the proposed test would provide an acceptable level of quality and safety.

2.0 REGULATORY EVALUATION

Section 50.55a, "Codes and Standards," of 10 CFR requires that inservice testing (IST) of certain ASME Code Class 1, 2, and 3 pumps and valves be performed at 120-month (10-year) IST program intervals in accordance with the specified ASME Code and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Nuclear Regulatory Commission (NRC) pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a.

In accordance with 10 CFR 50.55a(f)(4)(ii), licensees are required to comply with the requirements of the latest edition and addenda of the ASME Code incorporated by reference in the regulations 12 months prior to the start of each 120-month IST program interval. Further, in accordance with 10 CFR 50.55a(f)(4)(iv), IST of pumps and valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in 10 CFR 50.55a(b), subject to NRC approval.

Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provides alternatives to ASME Code requirements that are acceptable. Further guidance is

Enclosure

given in GL 89-04, Supplement 1, and NUREG-1482, Revision 1, "Guidance for Inservice Testing at Nuclear Power Plants." ASME OM code cases that are approved for use by the NRC are listed in Regulatory Guide (RG) 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code" dated June 2003.

### 3.0 PROPOSED ALTERNATIVE REQUEST

#### 3.1 Component Identification

The licensee requested to use a modified Group A test for the IST for the pumps in Table 3-1:

TABLE 3-1

Pump	Description	Current Classification
BSP-1A & 1B	Reactor Building Spray Pumps	Group B
CHP-1A & 1B	Chilled Water Supply Pumps	Group A
DCP-1A & 1B	Decay Heat Closed Cycle Cooling Water Pumps	Group A
DHP-1A & 1B	Decay Heat Pumps	Group A
EFP-3	Diesel Driven Emergency Feedwater Pump	Group B
RWP-2A & 2B	Emergency Duty Nuclear Services Raw Water Pumps	Group B
RWP-3A & 3B	Decay Heat Raw Water Pumps	Group A
SFP-1A & 1B	Spent Fuel Coolant Pumps	Group A
SWP-1A & 1B	Nuclear Services Closed Cycle Cooling Pumps	Group B

#### 3.2 Applicable Code Edition and Requirements

The applicable ASME OM Code edition and addenda for CR-3 is the 2001 Edition with Addenda through Omb-2003.

ASME OM Code Case testing requirement, ISTB-3400, "Frequency of Inservice Tests," states that an inservice test shall be run on each pump as specified in Table ISTB-3400-1. This table requires a Group A or Group B test to be performed quarterly and a comprehensive test to be performed biennially.

Table ISTB-3500-1, "Required Instrument Accuracy," defines the required instrument accuracy for Group A, Group B, comprehensive, and preservice tests.

Table ISTB-5100-1, "Centrifugal Pump Test Acceptance Criteria," defines the required acceptance criteria for Group A, Group B, and comprehensive tests for centrifugal pumps.

Table ISTB-5200-1, "Vertical Line Shaft and Centrifugal Pumps Test Acceptance Criteria," defines the required acceptance criteria for Group A, Group B, and comprehensive tests for vertical line shaft pumps.

### 3.3 Licensee's Basis for Relief

The licensee stated that using the provisions of this relief request as an alternative to the specific requirements of ISTB-5123 and ISTB-5223 will provide adequate indication of pump performance and continue to provide an acceptable level of quality and safety. Therefore, pursuant to 10CFR50.55a(a)(3)(i), the licensee requested relief from the specific ISTB requirements identified in the licensee's submittals for this relief request.

### 3.4 Proposed Alternative

The licensee proposes to perform modified Group A tests quarterly within plus or minus 20 percent of the pump design flow rate, with instrumentation meeting the instrument accuracy requirements of Table ISTB-3500-1 for the biennial comprehensive test, in lieu of the requirements of ISTB-3400 to perform comprehensive test. For the centrifugal pumps, the acceptable range for differential pressure would be 0.90 to 1.06 of the reference value. For the vertical line shaft pumps, the acceptable range for differential pressure would be 0.95 to 1.06 of the reference value, and the alert range would be 0.93 to 0.95 of the reference value. The licensee is proposing this alternative for the pumps listed in Table 3-1. Pumps BSP-1A, BSP-1B, EFP-3, RWP-2A, RWP-2B, SWP-1A and SWP-1B that are currently classified as Group B pumps and would be reclassified as Group A pumps. Pumps that tested quarterly using this alternative would be tested within plus or minus 20 percent of pump design flow, as is required for the biennial comprehensive test.

The licensee stated that the proposed alternative requires the accuracy of instruments used during quarterly modified Group A tests to meet the more accurate pressure and differential pressure requirements listed for the comprehensive test in Table ISTB-3500-1 (an accuracy improvement from plus or minus 2 percent to plus or minus ½ percent).

Pumps that would normally be categorized as Group B pumps, but are recategorized as Group A pumps, will be tested according to the provisions of this alternative. As a result of this recategorization from Group B to Group A, per Table ISTB-3000-1, additional data must be obtained quarterly rather than once every 2 years on the test parameters of vibration for these pumps.

Use of this alternative provides for consistent acceptance criteria for pump differential pressure tests. The licensee would consistently utilize the modified Group A test acceptance criteria (discussed above) for pump IST rather than having to utilize the comprehensive test criterion for

one biennial test. The acceptance criteria for vibration tests would be the same as for Group A tests shown in Tables ISTB-5100-1 and ISTB-5200-1.

### 3.5 Duration of Proposed Alternative

The proposed alternative will be implemented during the fourth 10-year IST interval, which began on May 11, 2009.

## 4.0 NRC STAFF'S EVALUATION

The licensee is proposing to reclassify the Group B pumps listed in Table 3-1 as Group A pumps, and perform IST for all the pumps listed in Table 3-1 in accordance with a modified Group A test procedure.

The ASME OM Code requires that for Group A pumps, a Group A test is performed every quarter, and a comprehensive test is performed biennially. The Group A test is performed within plus or minus 20 percent of the pump design flow rate (if practicable), the pressure instrument accuracy is plus or minus 2 percent, and the upper limit for the acceptable range for differential pressure is 110 percent of the reference value. The comprehensive test is performed within plus or minus 20 percent of the pump design flow rate, the pressure instrument accuracy is plus or minus ½ percent, and the upper limit of the acceptable range for differential pressure is 103 percent of the reference value. Vibration monitoring is performed during both the Group A test and comprehensive test.

The ASME OM Code requires that for Group B pumps, a Group B test is performed every quarter, and a comprehensive test is performed biennially. The Group B test is performed within plus or minus 20 percent of the pump design flow rate (if practicable), the pressure instrument accuracy is plus or minus 2 percent, and the upper limit for the acceptable range for differential pressure is 110 percent of the reference value. The comprehensive test is performed within plus or minus 20 percent of the pump design flow rate, the pressure instrument accuracy is plus or minus ½ percent, and the upper limit of the acceptable range for differential pressure is 103 percent of the reference value. Vibration monitoring is only performed during the comprehensive test.

The licensee proposes that for Group A pumps, to perform a modified quarterly test every quarter and not perform a biennial comprehensive test. The modified Group A quarterly test would be performed within plus or minus 20 percent of the pump design flow rate, using the more accurate pressure instrumentation that is required for a comprehensive test (plus or minus ½ percent versus plus or minus 2 percent). The pumps that will be reclassified from Group B to Group A also would be subject to the modified quarterly tests and would not be subject to a biennial comprehensive tests. Although, the ASME OM Code does not require vibration monitoring for Group B pump tests, the reclassified Group B pumps, similar to Group A pumps, would have vibration monitoring pump tests.

The licensee proposes, for the modified quarterly test, a more limiting upper bound of 106 percent for the acceptable range for differential pressure in lieu of 110 percent that is required by the ASME OM Code for Group A quarterly tests. However, this proposed upper bound of 106 percent is greater than the upper bound of 103 percent for the biennial

comprehensive pump test. All of the pump tests will be performed with pressure gauges with plus or minus ½ percent accuracy.

For the pumps that are currently classified as Group A and reclassified Group B pumps, the elimination of the comprehensive test (with its more limiting acceptable range upper bound of 103 percent) is compensated for by using more accurate pressure gauges on every quarterly test. This will provide for better trending of pump performance. Instead of performing seven tests with pressure gauges with plus or minus 2 percent accuracy, and then performing the eighth test with pressure gauges with plus or minus ½ percent accuracy, all eight tests will be performed with the same plus or minus ½ percent accurate gauges. Also, seven of the eight tests will have a tighter acceptable range. In addition, for the Group B pumps that will be reclassified as Group A pumps, all eight tests will include vibration monitoring. Therefore, the proposed alternative would provide reasonable assurance of the operational readiness of the pumps listed in Section 3.1 of this SE.

## 5.0 CONCLUSION

As set forth above, the NRC staff finds that the proposed alternative in RR 09-001-IT, Revision 0 provides reasonable assurance that pumps BSP-1A, BSP-1B, CHP-1A, CHP-1B, DCP-1A, DCP-1B, DHP-1A, DHP-1B, EFP-3, RWP-2A, RWP-2B, RWP-3A, RWP,3B, SFP-1A, SFP-1B, SWP-1A, and SWP-1B are operationally ready and continue to provide an acceptable level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(i), and is in compliance with the ASME OM Code's requirements. Therefore, the NRC staff authorizes the alternative in RR 09-001-IT, Revision 0 for the fourth 10-year inservice testing interval, which began on May 11, 2009.

Principal Contributor: Robert J. Wolfgang

March 15, 2010

Mr. Jon A. Franke, Vice President  
Crystal River Nuclear Plant (NA1B)  
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15760 W. Power Line Street  
Crystal River, Florida 34428-6708

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The Nuclear Regulatory Commission (NRC) staff has evaluated the licensee's relief request and found that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(i). The NRC staff has determined that the proposed alternative will provide an acceptable level of quality and safety, therefore pursuant to 10 CFR 50.55a(3)(i), the NRC staff authorizes the use of RR 09-001-IT for the fourth 10-year IST interval, which began on May 11, 2009.

The NRC staff's safety evaluation is enclosed. If you have any questions regarding this matter, please contact Farideh Saba at (301) 415-1447.

Sincerely,

*/RA/*  
Douglas A. Broaddus, Acting Chief  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-302

Enclosure: Safety Evaluation

cc w/enclosure: Distribution via ListServ

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