



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

July 13, 2012

Mr. William R. Gideon, Vice President
Carolina Power & Light Company
H. B. Robinson Steam Electric Plant,
3581 West Entrance Road
Hartsville, South Carolina 29550

SUBJECT: H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2 – RELIEF
REQUESTS-1 FOR THE FIFTH 10-YEAR INTERVAL INSERVICE TESTING
PROGRAM PLAN (TAC NO. ME8258)

Dear Mr. Gideon:

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated March 16, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12086A067), as supplemented by letter dated May 10, 2012 (ADAMS Accession No. ML12138A041), Carolina Power & Light Company (the licensee), doing business as Progress Energy Carolinas, Inc., submitted Relief Request (RR)-1 for the Inservice Testing (IST) Program Plan for the fifth 10-year Interval for the H. B. Robinson Steam Electric Plant, Unit No. 2 (HBRSEP).

The licensee proposed alternative testing methods and acceptance criteria described in the American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code) Code Case OMN-18, for the pumps listed in Table 3-1 of the safety evaluation (SE). This alternative will be used in lieu of current pump testing methods and acceptance criteria described in the ASME OM Code for HBRSEP. Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a(a)(3)(i), the licensee requested to use proposed alternatives on the basis that the alternatives provide an acceptable level of quality and safety.

The fourth 10-year interval in HBRSEP began on February 19, 2002, and was scheduled to end on February 18, 2012. As allowed by ASME Section XI, IWA-2430(d)1 the licensee extended the fourth 10-year interval through July 20, 2012, to complete the refueling outage-27 which was postponed to January 18, 2012. The duration of proposed alternative is for the fifth 10-year IST interval that begins on July 21, 2012, and ends on February 18, 2022.

As discussed with the licensee on July 9, 2012, the NRC staff is concerned with the amount of information provided in the submittal that required revision after review by and questions from the NRC staff, and your request for multiple concurrent reviews with a short review timeframe. The uncharacteristic inattention to detail observed in the submittal resulted in the need to focus limited resources to address mostly administrative issues. Additional attention to ensure a high quality submittal would allow for a more efficient use of review resources, and better ability of the NRC staff to accommodate requests for a shortened review timeframe.

W. Gideon

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The details of the NRC staff review are included in the enclosed SE. 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 requirements.

The use of ASME Code Case OMN-18 for IST-RR-1 is authorized until such time as the ASME Code Case OMN-18 is published in a future version of Regulatory Guide (RG) 1.192 "Operation and Maintenance Code Case Acceptability, ASME OM Code" and incorporated by reference in 10 CFR 50.55a(b). At that time, if the licensee intends to continue implementing this ASME Code Case, it must follow all provisions of ASME Code Case OMN-18 with the conditions as specified in RG 1.192 and limitations as specified in 10 CFR 50.55a(b)(4), (b)(5), and (b)(6), if any.

Therefore, the licensee's proposed alternatives for IST-RR-1 is authorized for the fifth 10-year IST interval at HBRSEP, which begins on July 21, 2012, and ends on February 18, 2022.

Sincerely,

/RA by Eva Brown for/

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

Docket No. 50-261

Enclosure:
Safety Evaluation

cc w/encl: Distribution via Listserv



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

ON THE FIFTH 10-YEAR INTERVAL INSERVICE TESTING PROGRAM PLAN

RELIEF REQUEST-1 AND RELIEF REQUEST-2

CAROLINA POWER & LIGHT COMPANY

H.B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

DOCKET NO. 50-261

1.0 INTRODUCTION

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated March 16, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12086A067), as supplemented by letter dated May 10, 2012 (ADAMS Accession No. ML12138A041), Carolina Power & Light Company (the licensee), doing business as Progress Energy Carolinas, Inc., submitted Relief Request (RR)-1 for the Inservice Testing (IST) Program Plan for the fifth 10-year Interval for the H. B. Robinson Steam Electric Plant, Unit No. 2 (HBRSEP).

The licensee proposed alternative testing methods and acceptance criteria described in the American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code) Code Case OMN-18, "Alternate Testing Requirements for Pumps Tested Quarterly Within \pm [plus or minus] 20 % [percent] of Design Flow," for the pumps listed in Table 3-1 of the safety evaluation (SE). This alternative will be used in lieu of current pump testing methods and acceptance criteria described in the ASME OM Code for HBRSEP.

The fourth 10-year interval in HBRSEP began on February 19, 2002, and was scheduled to end on February 18, 2012. As allowed by ASME Section XI, IWA-2430(d)1 the licensee extended the fourth 10-year interval through July 20, 2012, to complete the refueling outage-27 which was postponed to January 18, 2012. The duration of proposed alternative is for the fifth 10-year IST interval that begins on July 21, 2012, and ends on February 18, 2022.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a(f), "Inservice Testing Requirements," requires in part, that the IST of certain ASME Code Class 1, 2, and 3 components must meet the requirements of the ASME OM Code and applicable addenda, except where alternatives have been authorized pursuant to paragraphs (a)(3)(i) or (a)(3)(ii) of 10 CFR 50.55a.

In proposing alternatives, a licensee must demonstrate that the proposed alternatives provide an acceptable level of quality and safety. Paragraph 50.55a(a)(3) of 10 CFR states, in part, that alternatives to the requirements of 10 CFR 50.55a may be used, when authorized by the NRC,

if the licensee demonstrates (i) the proposed alternatives would provide an acceptable level of quality and safety or if (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The licensee requested authorization in IST-RR-1 of an alternative to the requirements of the ASME OM Code pursuant to 10 CFR 50.55a(a)(3)(i). The NRC staff approved a similar request to HBRSEP IST-RR-1, for Perry Nuclear Power Plant, Unit 1, on October 8, 2009 (ADAMS Accession No. ML092640690).

3.0 TECHNICAL EVALUATION

The NRC staff has evaluated the information provided by the licensee in support of IST RR-1 for relief from, or alternative to, the ASME OM Code requirements and the bases for disposition are documented below.

3.1 IST-RR-1

3.1.1 ASME Code Requirements

The applicable ASME OM Code edition and addenda for HBRSEP is the 2004 Edition through the 2006 Addenda.

ISTB-2000, "Supplemental Definitions," defines the uniform criteria for designating Group A and Group B pumps.

ISTB-3000, "General Testing Requirements," and Table ISTB-3000-1, "Inservice Test Parameters," define and compare parameters (e.g., pressure, flow rate, vibration) measured during Group A, Group B, and comprehensive pump tests.

ISTB-3400, "Frequency of Inservice Tests," states that, "An inservice test shall be run on each pump as specified in Table ISTB-3400-1."

Table ISTB-3400-1, "Inservice Test Frequency," notes that Group A and Group B tests shall be performed quarterly, and comprehensive pump tests shall be performed biennially.

Table ISTB-3510-1, "Required Instrument Accuracy," defines the required instrument accuracies for Group A, Group B, and comprehensive pump tests.

Table ISTB-5121-1, "Centrifugal Pump Test Acceptance Criteria," defines the required acceptance criteria for centrifugal pumps for Group A, Group B, and comprehensive tests.

ISTB-5123, "Comprehensive Test Procedure," provides the specific requirements for the comprehensive test for centrifugal pumps (except vertical line shaft centrifugal pumps).

Table ISTB-5221-1, "Vertical Line Shaft and Centrifugal Pumps Test Acceptance Criteria," defines the required acceptance criteria for vertical line shaft centrifugal pumps for Group A, Group B, and comprehensive tests.

ISTB-5223, "Comprehensive Test Procedure," provides the specific requirements for the comprehensive test for vertical line shaft centrifugal pumps.

Table ISTB-5321-2, "Reciprocating Positive Displacement Pump Test Acceptance Criteria," defines the required acceptance criteria for reciprocating positive displacement pumps for Group A, Group B and comprehensive tests.

ISTB-5323, "Comprehensive Test Procedure," provides the specific requirements for the comprehensive test for positive displacement pumps.

3.1.2 Component for which Relief is Requested

The licensee requested to use a modified quarterly Group A test for the IST in lieu of a quarterly Group A test and a biennial comprehensive test for the following pumps:

Table 3-1: Components for which Relief is Requested			
Pump	Description	Category	Type
BA-XFER-PMP-A	Boric Acid (BA) Transfer Pump A	Group A	Horizontal Centrifugal
BA-XFER-PMP-B	BA Transfer Pump B	Group A	Horizontal Centrifugal
CCW-PMP-A	Component Cooling Water (CCW) Pump A	Group A	Horizontal Centrifugal
CCW-PMP-B	CCW Pump B	Group A	Horizontal Centrifugal
CCW-PMP-C	CCW Pump C	Group A	Horizontal Centrifugal
CHG-PMP-A	Chemical Volume and Control System (CVCS) Charging Pump A	Group A	Reciprocating Positive Displacement
CHG-PMP-B	CVCS Charging Pump B	Group A	Reciprocating Positive Displacement
CHG-PMP-C	CVCS Charging Pump C	Group A	Reciprocating Positive Displacement
SWBP-A	Service Water (SW) Booster Pump A	Group A	Horizontal Centrifugal
SWBP-B	SW Booster Pump B	Group A	Horizontal Centrifugal
SW-PMP-A	SW Pump A	Group A	Vertical Line Shaft
SW-PMP-B	SW Pump B	Group A	Vertical Line Shaft
SW-PMP-C	SW Pump C	Group A	Vertical Line Shaft
SW-PMP-D	SW Pump D	Group A	Vertical Line Shaft

3.1.3 Licensee's Basis for Relief Request

The licensee requested relief from the requirements of ASME OM Code ISTB-5123, ISTB-5223, ISTB-5323, Table ISTB-3400-1, Table ISTB-5121-1, Table ISTB-5221-1, and Table ISTB-5321-2. The ASME OM Code Committee has approved Code Case OMN-18, which states, in part, that "the Group A test may be performed quarterly within ± 20 percent of pump design flow rate, with instrumentation meeting the requirements of Table ISTB-3510-1 for the comprehensive and preservice tests, and no comprehensive test is required."

The ASME Code Case OMN-18 was published in the 2009 Edition of the ASME OM Code. Code Case OMN-18 allows licensees to perform a Group A test in lieu of the biennial Comprehensive Pump Test (CPT) if the Group A tests are conducted at $\pm 20\%$ of the design flow rate and pressure instruments that meet the CPT accuracy requirement of $\pm 0.5\%$ are used. This Code Case was not reviewed for approval in Regulatory Guide (RG) 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," dated June 2003.

The basis for this change is that a quarterly Group A pump test, performed at the CPT flow rate and with CPT required pressure instrument accuracy, provides more consistent data for trending than a Group A test in conjunction with a biennial CPT. The increased requirements provided by the proposed alternative on the parameters to be monitored during every quarterly pump test and the more accurate instruments that must consistently be used during quarterly testing of the pumps classified as Group A, allow the licensee to perform better trending of pump performance data due to the more precise and consistent requirements for each of the quarterly tests. Due to the increased requirements on the parameters imposed by the proposed alternative during all quarterly tests, there is no added value in performing the biennial CPT.

3.1.4 Licensee's Proposed Alternative Examination

The licensee proposes that in lieu of the CPT requirements of Table ISTB-3400-1, Group A tests will be performed quarterly within $\pm 20\%$ of the pump design flow rate, with pressure measuring instrumentation meeting the ($\pm 0.5\%$) instrument accuracy requirements of Table ISTB-3510-1 specified for the biennial CPT. In addition, the licensee has elected to restrict the upper limit for acceptable range to 106% of the reference value (flow rate, differential pressure, or discharge pressure), which is more conservative than the 110% upper limit established in Tables ISTB-5121-1, ISTB-5221-1, and ISTB-5321-2 for Group A tests, as this limit provides needed margin while maintaining an acceptable level of quality and safety, and is consistent with the limit authorized by the NRC staff in a similar alternative request. The proposed change to the acceptance range is more restrictive than specified in the AMSE Code Case OMN-18.

Vibration testing will continue to be performed under the proposed modified Group A test and the acceptance criteria for vibration will be the same as required for Group A tests as shown in Tables ISTB-5121-1, ISTB-5221-1, and ISTB-5321-2.

Using the provisions of the request as an alternative to those specified in ISTB-5123, ISTB-5223, and ISTB-5323 will provide adequate indication of pump performance, permit consistent detection of component degradation, and continue to provide an acceptable level of quality and safety.

3.1.5 NRC Staff Evaluation

The licensee proposed to perform a quarterly IST for all the pumps listed in Table 3-1 in accordance with a modified Group A test procedure, in lieu of a quarterly Group A test and a biennial CPT.

The ASME OM Code requires that for Group A pumps, a Group A test be performed every quarter, and a CPT be performed biennially. The Group A test is performed within $\pm 20\%$ of the pump design flow rate and the pressure instrument accuracy is $\pm 2\%$. The upper limit for the "Acceptable Range" for flow rate, differential pressure, and discharge pressure is 110% of

the reference values, and the high value for the "Required Action Range" for flow rate, differential pressure, and discharge pressure is greater than 110% of the reference values. The CPT is performed within $\pm 20\%$ of the pump design flow rate, the pressure instrument accuracy is $\pm 0.5\%$, and the upper limit of the "Acceptable Range" and "Required Action Range" for flow rate, differential pressure, and discharge pressure is 103% of the reference values. Vibration monitoring is performed during both the Group A tests and the CPTs.

The licensee proposes that for the pumps listed in Table 3-1, a modified Group A quarterly test will be performed using ASME OM Code Case OMN-18, with modified "Acceptable" and "Required Action" ranges, and the biennial CPT will not be performed. The modified Group A quarterly test would be performed within $\pm 20\%$ of the pump design flow rate, using more accurate pressure instrumentation that is required for a CPT ($\pm 0.5\%$ instead of $\pm 2\%$). The licensee will use a more limiting upper bound of 106% of the reference value for the "Acceptable Range" for flow rate, differential pressure, and discharge pressure, in lieu of 110% of the reference value that is normally required by the ASME OM Code for Group A tests. However, this upper bound of 106% is greater than the upper bound value of 103% for the biennial CPT. Using more accurate pressure gauges and a more limiting "Acceptable Range" (compared to the Group A test "Acceptable Range") during every modified quarterly Group A test compensates for the elimination of the CPT with its more limiting "Acceptable Range" upper bound value of 103%.

ASME Code Case OMN-18 was published in the 2009 Edition of ASME OM Code. This Edition of the ASME OM Code has not been incorporated by reference into 10 CFR 50.55a, and OMN-18 has not been incorporated into RG 1.192. However, the NRC staff has reviewed OMN-18, and currently has no concerns with its usage, providing that the upper end values of the Group A test "Acceptable Ranges" for flow, differential pressure, and pressure are 106% of the respective reference values, and the high values of the "Required Action Ranges" for flow, differential pressure, and pressure are greater than 106% of the respective reference values.

The NRC staff considers the proposed alternative acceptable because all of the tests will be performed with pressure gauges with $\pm 0.5\%$ accuracy. The elimination of the CPT, with its more limiting "Acceptable Range" upper bound of 103% of the reference value, is compensated for by using more accurate pressure instrumentation on every quarterly test. Regular testing with more accurate instrumentation and tighter acceptance criteria will provide for better trending of pump performance. Therefore, the NRC finds that the proposed alternative provides an acceptable level of quality and safety for testing and acceptance criteria for the pumps listed in Table 3-1.

4.0 CONCLUSION

The NRC staff finds that the proposed alternative described in IST-RR-1 provides an acceptable level of quality and safety for the pumps listed in Tables 3-1. 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 described in IST-RR-1 for the HBRSEP fifth, 10-year, IST interval, which begins on July 21, 2012, and ends on February 18, 2022.

The use of ASME Code Case OMN-18 for IST-RR-1 is authorized until such time as the ASME Code Case OMN-18 is published in a future version of RG 1.192 and incorporated by reference

in 10 CFR 50.55a(b). At that time, if the licensee intends to continue implementing this ASME Code Case, it must follow all provisions of ASME Code Case OMN-18 with conditions as specified in RG 1.192 and limitations as specified in 10 CFR 50.55a(b)(4), (b)(5), and (b)(6), if any.

All other ASME Section XI requirements for which relief was not specifically requested and authorized by the NRC staff will remain applicable including third party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: Robert Wolfgang

Date of issuance: July 13, 2012

W. Gideon

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The details of the NRC staff review are included in the enclosed SE. 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 requirements.

The use of ASME Code Case OMN-18 for IST-RR-1 is authorized until such time as the ASME Code Case OMN-18 is published in a future version of Regulatory Guide (RG) 1.192 "Operation and Maintenance Code Case Acceptability, ASME OM Code" and incorporated by reference in 10 CFR 50.55a(b). At that time, if the licensee intends to continue implementing this ASME Code Case, it must follow all provisions of ASME Code Case OMN-18 with the conditions as specified in RG 1.192 and limitations as specified in 10 CFR 50.55a(b)(4), (b)(5), and (b)(6), if any.

Therefore, the licensee's proposed alternatives for IST-RR-1 is authorized for the fifth 10-year IST interval at HBRSEP, which begins on July 21, 2012, and ends on February 18, 2022.

Sincerely,

/RA by Eva Brown for/

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

Docket No. 50-261

Enclosure:
Safety Evaluation

cc w/encl: Distribution via Listserv

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