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 REQUEST-5 FOR THE FIFTH 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN (TAC NO. ME8256)

Dear Mr. Gideon:

By letter to the U.S. Nuclear Regulatory Commission (NRC) dated March 14, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12082A009), as supplemented by letter dated May 10, 2012 (ADAMS Accession No. ML12138A010), Carolina Power & Light Company (the licensee), doing business as Progress Energy Carolinas, Inc., submitted Relief Request-5, for the Inservice Inspection (ISI) Program Plan for the fifth 10-year Interval for the H. B. Robinson Steam Electric Plant, Unit No. 2 (HBRSEP).

The licensee requested approval to use a proposed alternative to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," IWA-5250(a)(2), for the visual examination requirements of bolting during system pressure tests at 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 fifth10-year ISI 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.

The details of the NRC staff review are included in the enclosed safety evaluation. 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, therefore, is in compliance with the ASME Code requirements.

Therefore, the licensee's proposed alternative is authorized in accordance with 10 CFR 50.55a(a)(3)(i) for the fifth 10-year ISI 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 INSPECTION PROGRAM

RELIEF REQUEST-5

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 14, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12082A009), as supplemented by letters dated May 10, 2012 (ADAMS Accession No. ML12138A010), Carolina Power & Light Company (the licensee), doing business as Progress Energy Carolinas, Inc., submitted Relief Request (RR)-5 for the Inservice Inspection (ISI) Program Plan for the fifth 10-year Interval for the H. B. Robinson Steam Electric Plant, Unit No. 2 (HBRSEP).

The licensee requested approval to use a proposed alternative to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (ASME Code), Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," for the visual examination requirements of bolting during system pressure tests at 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 ASME Code of record for the fifth 10-year ISI interval at HBRSEP is ASME Code, Section XI, 2007 Edition with 2008 Addenda. The duration of proposed alternative is for the fifth10-year ISI 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(g)(4), specifies that ASME Code Class 1, 2 and 3, components (including supports) must meet the requirements, except for the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code, incorporated by reference in 10 CFR 50.55a(b), 12-months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein.

Section 50.55a(a)(3) to 10 CFR states, in part, that alternatives to the requirements of 10 CFR 50.55a(g) 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 of an alternative to the requirements Article IWA-5000 of the ASME Code, Section XI, pursuant to 10 CFR 50.55a(a)(3)(i).

The NRC staff has previously approved this alternative for HBRSEP for the fourth 10-year interval on September 26, 2002, (ADAMS Accession No. ML022700601).

3.0 TECHNICAL EVALUATION

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

3.1 ASME Code Requirements

ASME Code, Section XI, 2007 Edition with 2008 Addenda, IWA-5250(a)(2), "Corrective Action," requires that if leakage occurs at a bolted connection in a system borated for the purpose of controlling reactivity, one of the bolts shall be removed, visual testing (VT)-3 examined, and evaluated in accordance with IWA-3100. The bolt selected shall be the one closest to the source of leakage. When the removed bolt has evidence of degradation, all remaining bolting in the connection shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100.

3.2 Component for which Relief is Requested

The licensee requested relief from examining the ASME Class 1, 2, and 3 pressure retaining bolting.

3.3 Licensee's Basis for Relief Request

The licensee stated in the March 14, 2012, submittal that the use of a VT-1 examination in lieu of the ASME Code required VT-3 examination will provide a comparable level of quality and safety. The VT-1 examination for pressure retaining bolting is referenced in Section XI of the ASME Code. The licensee stated that the guidance for performing VT-1 examinations for pressure retaining bolting are incorporated within examination procedures of HBRSEP and are considered more stringent than those associated with the VT-3 examination. According to the licensee, the VT-1 examination is performed with VT-1 personnel certified in accordance with ASME Code Section XI.

The licensee further stated that (1) leakage will be confirmed by inspection and that (2) bolting degradation is acceptable if the bolting is not in direct contact with borated water. The licensee stated that HBRSEP uses a Boric Acid Program (EGR-NGGC-0207) that is not an ASME Code inspection requirement. However, the Boric Acid Program may be implemented in conjunction with IWA-5250(a)(2) for borated piping systems and currently recommends performing a VT-1 examination for corrosion damage during discovery evolutions that merit further evaluation, as part of the planning and repair activities.

The licensee indicated in the submittal that the purpose of the Boric Acid Program procedure is to (1) establish the requirements for minimizing the effects of boric acid corrosion on pressurized-water reactor structures, systems, and components; (2) provide instructions for the inspection, reporting, evaluation, and corrective actions required when boric acid residue is found; and (3) provide guidance for evaluating components that have been found to have wastage caused by boric acid corrosion. Additionally, if bolting in the non-borated piping system is affected by the identified leakage source in the borated piping system, the bolting (e.g., borated water from a pipe leak onto the bolting in a non-borated piping system) in the non-borated piping would be examined in accordance with this RR.

The licensee described in ISI-RR -4 the actions needed to address bolted connection removal required by IWA-5250(a)(2) in Section XI of the ASME Code. When leakage occurs at a bolted connection, the ASME Code requires removal of a bolt closest to the source of the leakage, and prescribes the actions necessary if degradation is identified. The ASME Code does not specifically address the actions necessary to stop leakage at a bolted connection, since such leakage may have a variety of sources. HBRSEP has plant processes in place to address the leakage source, such as generation of a corrective maintenance work order for leakage or evidence of leakage and employ the evaluation elements of the Boric Acid Program. ISI-RR-4 is intended to address the actions necessary to address leakage identified at bolted connections, and required actions to be performed at the bolted connection, as required by IWA-5250(a)(2).

3.4 Licensee's Proposed Alternative Examination

The licensee requested relief from the ASME Code, Section XI, 2007 Edition with 2008 Addenda, IWA-5250(a)(2), regarding the actions to be taken when leakage occurs at a bolted connection in a system borated for controlling reactivity, during the conduct of a system pressure test. Removal and examination of one bolt closest to the source of leakage would be by VT-1 visual examination in lieu of the ASME Code-required VT-3 visual examination.

The licensee stated in the May 10, 2012, letter that if leakage is identified and in contact with a bolted connection in a system borated for controlling reactivity during the conduct of a system pressure test, the following actions will be taken:

1. The bolt in contact with the source of leakage will be removed and a VT-1 visual examination performed. The bolt selected shall be the one closest to the source of the leakage. The condition will be evaluated in accordance with IWA-3100. When the removed bolt shows evidence of degradation, the remaining bolting will be removed, a VT-1 visual examination performed, and the condition will be evaluated in accordance with IWA-3100.

2. Should bolting in the non-borated piping system be affected by the identified leakage source in the borated piping system, the bolting in the non-borated piping would be examined in accordance with this relief request.

3.5 NRC Staff Evaluation

As discussed above, when performing a system pressure test, the licensee proposed to use the VT-1 examination in lieu of the VT-3 examination as required in IWA-5250(a)(2) in Section XI of the ASME Code. The NRC staff compared the differences in the requirements for the VT-1 and

VT-3 examinations in the ASME Code, Section XI, IWA-2211 and IWA-2213, respectively. Subparagraphs (a), (b), and (c) of IWA-2211 and IWA-2213 are different. Subparagraphs (d), (e), (f), and (g) of IWA-2211 and IWA-2213 are the same.

IWA-2211(a) specifies that the VT-1 examination is conducted to detect discontinuities and imperfections on the surface of components, including such conditions as cracks, wear, corrosion, or erosion.

IWA-2213(a) specifies that the VT-3 examination is conducted to determine the general mechanical and structural condition of components and their supports by verifying parameters such as clearances, settings, and physical displacements; and to detect discontinuities and imperfections, such as loss of integrity at bolted or welded connections, loose or missing parts, debris, corrosion, wear or erosion.

Subparagraphs (b) and (c) of IWA-2211 provide the requirements on the maximum height for procedure demonstration characters and maximum direct examination distance, respectively. Table IWA-2211-1 specifies different qualification criteria for VT-1 and VT-3 examinations. Table IWA-2211-1 requires that the (1) VT-1 examination be conducted with a minimum illumination of 50 foot-candle, a maximum direct examination distance of 2 feet, and a maximum height for procedure demonstration characters of 0.044 inches; and (2) that the VT-3 examination be conducted with a minimum illumination of 50 foot-candle and a maximum height for procedure demonstration characters of 0.105 inch. Table IWA-2211-1 does not provide a maximum direct examination distance requirement for the VT-3 examination.

As discussed above, the VT-1 examination is used to detect small surface cracks whereas the VT-3 examination is used to detect gross deformation and degradation. The NRC staff notes that as required by Table IWA-2211-1, the qualification for the VT-1 examination is more stringent that of VT-3 examination because VT-1 examination requires the examiner to observe smaller characters than the VT-3 examination (0.044 inches vs. 0.105 inches). Also, the VT-1 examination is required to be conducted within a distance of 2 feet whereas the VT-3 examination has no distance requirement. The NRC staff finds that the VT-1 examination will be able to detect the gross degradation and deformation of the component that the VT-3 examination is able to detect in addition to the small flaws.

Based on the above comparisons, the NRC staff finds that the VT-1 examination will provide the acceptable quality of the inspection with respect to the VT-3 examination.

The NRC staff questioned whether the proposed VT-1 examination is applicable to bolting that is not part of a borated piping system, but is in contact with borated water due to leakage from borated piping (e.g., borated water from a pipe leaks onto the bolting in a non-borated piping system). By letter dated May 10, 2012, the licensee supplemented the RR to require that if bolting in the non-borated piping system is affected by the identified leakage source in the borated piping system, the bolting in the non-borated piping would be examined in accordance with the RR. The NRC staff finds the licensee's revised requirement for the non-borated bolting acceptable.

Additionally in the May 10, 2012, submittal, the licensee updated the RR in the following areas:

a) The licensee clarified that it requested relief from IWA-5250(a)(2) only.

b) The licensee confirmed that Section XI, 2007 edition with 2008 Addenda, IWA-2210 and IWA-2211 requirements will be utilized for VT-1 application relative to method, definition, procedure requirements and personnel qualifications.

c) The licensee updated RR-05 in accordance with IWA-5250(a)(2) for selecting the bolt closest to the source of leakage.

The licensee stated that other areas within ASME Section XI where bolting examination is required, such as requirements associated with IWB-2500 tables, the surface examination methods are VT-1. The licensee also stated that the RR merely aligns the requirements relative to VT-1 on bolting. HBRSEP has VT-1 procedures in place and are aligned to meet the requirements associated with performing the VT-1 in accordance with the ASME Code. The NRC staff finds that the revised wording in RR-05 provided in the letter dated May 10, 2012, is consistent with that of IWA-5250(a)(2) other than the VT-1 examination, and, therefore, the revision is acceptable.

By letter dated May 10, 2012, the licensee also stated that the HBRSEP Boric Acid Program EGR-NGGC-0207, is not an ASME Code inspection requirement; however, when required, it invokes VT-1 inspections for corrosion damage through the work order process. The NRC staff finds that the licensee is using VT-1 examination as part of Boric Acid Program and, therefore, the visual examination for the boric acid program is consistent with the visual examination for the system pressure test.

The NRC staff finds that the licensee's proposed alternative of using VT-1 examination in lieu of VT-3 examination provides the same, if not enhanced, quality of inspection as that of IWA-5250(a)(2). In addition, in the proposed alternative, the licensee will examine the bolting in the non-borated piping system if it is affected by the identified leakage source in the borated piping system. Although not part of the proposed alternative, the licensee's Boric Acid Program EGR-NGGC-0207 will provide additional monitoring of potential leakage from bolted connections.

4.0 CONCLUSION

The NRC staff determines that the proposed alternative provides an acceptable level of quality and safety for the inspection of the bolted joints during system pressure tests per the ASME Code, Section XI, IWA-5250(a)(2). 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). Therefore, the NRC staff authorizes the use of the updated proposed alternative as documented in submittal dated May 10, 2012, for the system pressure tests at HBRSEP, for the fifth 10-year ISI interval that begins on July 21, 2012, and ends on February 18, 2022.

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: John Tsao

Date of issuance: July 13, 2012

Therefore, the licensee's proposed alternative is authorized in accordance with 10 CFR 50.55a(a)(3)(i) for the fifth 10-year ISI 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

DISTRIBUTION:

PUBLIC	RidsAcrsAcnw_MailCenter	RidsNrrPMRobinson	RidsNrrLABClayton	RidsRgn2MailCenter
LPL2-2 R/F	RidsNrrDorlLpl2-2	JTsao, NRR	RidsOgcRp	RidsNrrDeEpnb

ADAMS Accession No.: ML12165A612 * Via Memo

OFFICE	LPL2-2/PM	LPL2-2/LA	DE/EPNB/BC*	LPL2-2/BC	LPL2-2/BC
NAME	ABillochColón	BClayton	DAlley(A)	DBroaddus (EBrown for)	ABillochColón
DATE	6/13/12	6/20/12	5/31/12	7/13/12	7/13/12

OFFICIAL RECORD COPY