



10 CFR 50.55a(a)(3)(i)

JAN 20 2004

SERIAL: BSEP 04-0007

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

SUBJECT: Brunswick Steam Electric Plant, Unit Nos. 1 and 2  
Docket Nos. 50-325 and 50-324/License Nos. DPR-71 and DPR-62  
Request to Use American Society of Mechanical Engineers (ASME)  
Boiler and Pressure Vessel Code Case N-663

Ladies and Gentlemen:

In accordance with 10 CFR 50.55a(a)(3)(i), Carolina Power & Light (CP&L) Company, now doing business as Progress Energy Carolinas, Inc., requests the NRC approve the use of an alternative to the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI requirements regarding examination of Class 2, Examination Category C-F-2 piping welds at the Brunswick Steam Electric Plant (BSEP), Units 1 and 2. Enclosure 1 provides a copy of the proposed alternative, designated as Relief Request RR-33. Enclosure 2 provides a copy of ASME Code Case N-663.

The proposed alternative will allow BSEP, Units 1 and 2, to avoid unnecessary examinations and radiological dose, while maintaining an acceptable level of quality and safety for the examination of the affected welds. The relief request is applicable to the third 10-year inservice inspection interval for BSEP, Units 1 and 2. The applicable code of record for this inspection interval is the 1989 Edition, with no Addenda, of the ASME Code, Section XI.

Progress Energy Carolinas, Inc. requests approval of the enclosed relief request by July 1, 2004. Approval of the alternative is requested for the remainder of the third 10-year inservice inspection program, or until Code Case N-663 is published in a future version of NRC Regulatory Guide (RG) 1.147, *Inservice Inspection Code Case Acceptability - ASME Section XI, Division 1*, in which case the provisions of the Code Case N-663 conditions and limitations specified in RG 1.147 will be followed.

Similar requests for relief have been granted to the Arkansas Nuclear 1, Grand Gulf, River Bend, and Waterford 3 plants (i.e., refer to ADAMS Accession Numbers ML030150438 and ML032390190), and requested by the Indian Point and Pilgrim plants (i.e., refer to ADAMS Accession Number ML033490593).

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There are no new commitments made in this letter. Please refer any questions regarding this submittal to Mr. Leonard R. Beller, Supervisor - Licensing/Regulatory Programs, at (910) 457-2073.

Sincerely,

A handwritten signature in black ink, appearing to read "E. T. O'Neil", with a stylized flourish at the end.

Edward T. O'Neil  
Manager - Support Services  
Brunswick Steam Electric Plant

WRM/wrm

Enclosures:

1. Relief Request (RR) 33, Revision 0 — Alternative to Surface Examination on Class 2 Piping per Code Case N-663
2. ASME Code Case N-663 (**For Information**)

cc (with enclosures):

U. S. Nuclear Regulatory Commission, Region II  
ATTN: Mr. Luis A. Reyes, Regional Administrator  
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U. S. Nuclear Regulatory Commission  
ATTN: Mr. Eugene M. DiPaolo, NRC Senior Resident Inspector  
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Ms. Jo A. Sanford  
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Mr. Jack Given, Bureau Chief  
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Boiler Safety Bureau  
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**Relief Request (RR) 33, Revision 0 — Alternative to Surface Examination on Class 2 Piping per Code Case N-663**

**1. Components Affected**

Component Numbers: ASME Code, Section XI, Class 2 piping welds  
Examination Category: Category C-F-2  
Item Numbers: C5.50, C5.60, C5.80

**2. Applicable Code Edition and Addenda**

The code of record for the third 10-year inservice inspection interval is the American Society of Mechanical Engineers (ASME) Code, Section XI, 1989 Edition, with no addenda.

**3. Code Requirement**

The ASME Code, Section XI, IWC-2500 requires components to be examined and pressure tested as specified in Table IWC-2500-1. This table requires a sampling of piping welds, as well as other components, to be subjected to various types of non-destructive examinations (NDE) (i.e., volumetric and/or surface examinations) and pressure testing (i.e., visual VT-2).

**4. Proposed Alternative**

In accordance with 10 CFR 50.55a(a)(3)(i), Progress Energy Carolinas, Inc. proposes to use ASME Code Case N-663, in its entirety, as an alternative to the surface examination requirements of Table IWC-2500-1 for examination category C-F-2.

**5. Reason for Request**

The ASME Code, Section XI, IWC-2500, requires surface examinations of the general population of Category C-F-2 welds. The proposed alternative described in ASME Code Case N-663 would require surface examination of areas identified as being susceptible to outside surface attack, thereby avoiding unnecessary examinations and radiological dose while maintaining an acceptable level of quality and safety for the examination of the affected welds.

## 6. Basis for Use

The subject item numbers in the ASME Code, Section XI require a volumetric and/or surface examination on selected piping welds to ensure that generic degradation mechanisms are not active on either the inside diameter (I.D.) or the outside diameter (O.D.). However, these welds are selected using a deterministic set of requirements that are not based upon degradation mechanisms. ASME Code Case N-663 provides an alternative to the current ASME Code, Section XI requirements for defining the number and location of surface examinations for piping components.

The ASME Section XI Task Force on Inservice Inspection Optimization, Report No. 92-01-01, *Evaluation of Inservice Inspection Requirements for Class 1, Category B-J Pressure Retaining Welds in Piping*, dated July 1995, concluded, with 50 units responding with a total of 9333 welds inspected, only two welds (i.e., 0.02%) were found to have flaws detected by Section XI surface examinations. These flaws were determined to be fabrication-induced.

In parallel with the above, several risk-informed code cases have been developed for use on piping welds (e.g. ASME Code Cases N-560, N-577, and N-578). One of the methods for risk-informing piping examinations is through use of Electric Power Research Institute (EPRI) topical report TR-112657, Revision B-A, *Revised Risk-Informed Inservice Inspection Evaluation Procedure*, approved by NRC safety evaluation dated October 28, 1999. Table 4-1, *Summary of Degradation-Specific Inspection Requirements and Examination Methods*, of the EPRI report lists the required degradation mechanisms to be evaluated in Class 1, 2, and 3 piping. It identifies the risk-informed examination method required for each of these degradation mechanisms. The only degradation mechanism that requires a surface examination is O.D. chloride cracking. These two initiatives led ASME to investigate the value of surface examinations.

Code Case N-663 incorporated lessons learned from the risk-informed initiatives and industry examination experience into Section XI by requiring that an evaluation be conducted to identify locations, if any, where a surface examination would be of benefit from a generic piping degradation perspective. The results of this evaluation identify where O.D. degradation is most likely to occur by reviewing plant-specific programs and practices and operating experience. If the potential for degradation is identified, Code Case N-663 defines examination techniques, volumes, and frequencies. As such, implementing Code Case N-663 will identify appropriate locations for surface examination, if any, and eliminate the unnecessary examinations. Other ASME Code, Section XI examination requirements for the subject piping welds, including volumetric examinations and pressure testing, will continue to be performed.

Code Case N-663 was approved by the ASME Boiler and Pressure Vessel Code Committee on September 17, 2002, but has not yet been included in the most recent listing of NRC

approved code cases provided in Revision 13 of Regulatory Guide (RG) 1.147, *Inservice Inspection Code Case Acceptability – ASME Section XI Division 1*.

## 7. Duration of Proposed Alternative

Approval of the alternative is requested for the remainder of the third 10-year inservice inspection program. If Code Case N-663 is published in a future version of RG 1.147, the provisions of the Code Case N-663 conditions and limitations specified in RG 1.147 will be followed.

## 8. References

1. ASME Code, Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components*, 1989 Edition (no Addenda).
2. Title 10 of the Code of Federal Regulations, Part 50, Section 55a, *Codes and Standards* (i.e., 10 CFR 50.55a).
3. ASME Section XI Task Group on ISI Optimization, Report No. 92-01-01, *Evaluation of Inservice Inspection Requirements for Class 1 Category B-J Pressure Retaining Welds in Piping*, dated July 1995.
4. ASME Code Case N-663, *Alternative Requirements for Classes 1 and 2 Surface Examinations, Section XI, Division 1*.
5. NRC Regulatory Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, Revision 13, June 2003.

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Enclosure 2

ASME Code Case N-663

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

Approval Date: September 17, 2002

*See Numeric Index for expiration  
and any reaffirmation dates.*

**Case N-663**

**Alternative Requirements for Classes 1 and 2**

**Surface Examinations**

**Section XI, Division 1**

*Inquiry:* What alternative to the surface examination requirements for piping welds of Examination Categories B-F, B-J, C-F-1, and C-F-2 may be used?

*Reply:* It is the opinion of the Committee that in lieu of the surface examination requirements for piping welds of Examination Category B-F (NPS 4 and larger), B-J (NPS 4 and larger), C-F-1, and C-F-2, surface examinations may be limited to areas identified by the Owner as susceptible to outside surface attack.

Susceptibility to outside surface attack shall be determined in accordance with Table 1.

Examination Category B-F less than NPS 4 and Examination Category B-J less than NPS 4 shall be examined in accordance with IWB-2500.

All areas identified as susceptible to outside surface attack shall be examined during each interval. The requirements of IWB-2411, IWB-2412, IWC-2411, and IWC-2412, as applicable, shall be met. Acceptance standards shall be in accordance with IWB-3514 or IWC-3514, as applicable. The areas shall be reexamined in the same sequence, during subsequent inspection intervals over the service lifetime of the piping item, to the extent practical.

TABLE 1  
SUSCEPTIBILITY CRITERIA

Mechanism	Criteria
External chloride stress corrosion cracking	<ul style="list-style-type: none"> <li>• austenitic stainless steel base metal, welds, or heat affected zone (HAZ), and</li> <li>• operating temperature &gt; 150°F, and</li> <li>• a piping outside surface is within five pipe diameters of a probable leak path (e.g., valve stem) and is covered with nonmetallic insulation that is not in compliance with U.S. NRC Regulatory Guide 1.36 (e.g., chloride content) or equivalent requirements</li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>• austenitic stainless steel base metal, welds, or HAZ, and</li> <li>• a piping outside surface is exposed to wetting from a concentrated chloride-bearing environment (e.g., seawater, brackish water, brine)</li> </ul>
Other outside surface initiated mechanisms	Items identified as susceptible to outside surface attack by a plant-specific service history review. This review should include plant-specific processes and programs that minimize chlorides and other contaminants.