



**Carolina Power & Light Company**

Robinson Nuclear Plant  
3581 West Entrance Road  
Hartsville SC 29550

Serial: RNP-RA/00-0142

AUG 10 2000

United States Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
DOCKET NO. 50-261/LICENSE NO. DPR-23

REQUEST FOR RELIEF FROM ASME BOILER AND PRESSURE  
VESSEL CODE, SECTION XI, REGARDING ULTRASONIC EXAMINATION OF  
FULL PENETRATION NOZZLES IN VESSELS (EXAMINATION CATEGORY B-D)

Ladies and Gentlemen:

In accordance with 10 CFR 50.55a(a)(3), this letter requests relief from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," regarding Examination Category B-D for ultrasonic examination of full penetration welds for nozzles in vessels.

H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, requests relief to implement alternative requirements to those specified in ASME B&PV Code, Section XI, 1986 Edition with no addenda, Table IWB-2500-1, "Examination Categories," Examination Category B-D, Item No. B3.90, which requires a volumetric examination of nozzle-to-vessel welds in accordance with Figures IWB-2500-7(a) and IWB-2500-7(b). The proposed alternative is to perform the nozzle-to-vessel weld examination in accordance with ASME Code Case N-613, "Ultrasonic Examination of Full Penetration Nozzles in Vessels, Examination Category B-D, Item No's. B3.10 and B3.90, Reactor Vessel-To-Nozzle Welds, Fig. IWB-2500-7(a), (b), and (c) Section XI, Division 1."

Additionally, the requested relief would implement the requirements of ASME Code Case N-613 in lieu of the requirements of ASME B&PV Code, Section V, "Nondestructive Examination," 1986 Edition, Article 4, "Ultrasonic Examination Methods for Inservice

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Inspection," for performance of the required volumetric examinations. These volumetric examination requirements are delineated within ASME B&PV Code, Section XI, IWA-2232, "Ultrasonic Examination," which is invoked by Table IWB-2500-1 for Examination Category B-D.

In accordance with 10 CFR 50.55a(a)(3)(ii), this relief is requested on the basis that compliance with the specified requirements of the Code would result in hardship or unusual difficulty without a commensurate increase in the level of quality and safety. Implementation of ASME Code Case N-613 is expected to substantially reduce on-vessel examination time, which will result in a corresponding reduction in occupational radiation exposure.

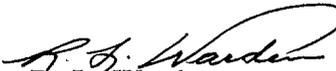
HBRSEP, Unit No. 2, is currently in the Third Ten Year Inservice Inspection (ISI) Interval, which began on February 19, 1992. This relief, if approved, will be implemented during the Third Ten Year ISI Interval.

Approval of this relief is requested by February 1, 2001, to allow implementation during Refueling Outage 20.

This relief is similar in nature to the relief granted to St. Lucie Plant, Unit 2, by NRC letter dated October 4, 1999 (Docket No. 50-389).

If you have any questions regarding this matter, please contact Mr. H. K. Chernoff.

Sincerely,



R. L. Warden

Manager - Regulatory Affairs

CTB/ctb

Attachment:

Relief Request No. 30, Ultrasonic Examination Of Full Penetration Nozzles In Vessels  
(Examination Category B-D)

c: Mr. L. A. Reyes, NRC, Region II  
Mr. R. Subbaratnam, NRC, NRR  
NRC Resident Inspector

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2  
RELIEF REQUEST NO. 30  
ULTRASONIC EXAMINATION OF  
FULL PENETRATION NOZZLES IN VESSELS (EXAMINATION CATEGORY B-D)

**Code Requirements for Which Relief is Requested**

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 1986 Edition with no addenda, Table IWB-2500-1, "Examination Categories," Examination Category B-D, Item No. B3.90, requires a volumetric examination of nozzle-to-vessel welds in accordance with Figures IWB-2500-7(a) and IWB-2500-7(b).

Additionally, ASME B&PV Code, Section V, "Nondestructive Examination," 1986 Edition, Article 4, "Ultrasonic Examination Methods for Inservice Inspection," prescribes requirements for the performance of volumetric examinations. These volumetric examination requirements are delineated within ASME B&PV Code, Section XI, IWA-2232, "Ultrasonic Examination," which is invoked by Table IWB-2500-1 for Examination Category B-D.

**Specific Relief Requested**

H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, requests relief through implementation of the alternative examination requirements provided by ASME Code Case N-613, "Ultrasonic Examination of Full Penetration Nozzles in Vessels, Examination Category B-D, Item No's. B3.10 and B3.90, Reactor Vessel-To-Nozzle Welds, Fig. IWB-2500-7(a), (b), and (c) Section XI, Division 1," in lieu of the volumetric examination requirements identified by ASME B&PV Code, Section XI, 1986 Edition with no addenda, Figures IWB-2500-7(a) and IWB-2500-7(b).

Additionally, relief is requested to implement ASME Code Case N-613 in lieu of the examination requirements provided by ASME B&PV Code, Section V, Article 4, for performance of the required volumetric examinations. These volumetric examinations are delineated within ASME B&PV Code, Section XI, IWA-2232, "Ultrasonic Examination," which is invoked by Table IWB-2500-1 for Examination Category B-D.

**Alternative Examinations**

Relief is requested from the volumetric examination requirements specified by ASME B&PV Code Section XI, Figures IWB-2500-7(a) and IWB-2500-7(b), and ASME B&PV Code, Section V, Article 4, as described above. These volumetric examinations will be performed in accordance with ASME Code Case N-613.

### **Alternative Examinations (Continued)**

HBRSEP, Unit No. 2, intends to perform the required examinations using Performance Demonstration Initiative (PDI) Program techniques<sup>1</sup>, to the extent practical, in accordance with ASME B&PV Code, Section XI, Division 1, 1995 Edition, 1996 addenda, Appendix VIII.

Periodic system leakage tests will be conducted each refueling outage in accordance with ASME B&PV Code, Section XI, Table IWB-2500-1, Category B-P.

### **Basis for Requesting Relief**

In accordance with 10 CFR 50.55a(a)(3)(ii), relief is requested on the basis that compliance with the specified requirements of the Code would result in hardship or unusual difficulty without a commensurate increase in the level of quality and safety. Implementation of ASME Code Case N-613 is expected to substantially reduce on-vessel examination time, which will result in a corresponding reduction in occupational radiation exposure.

### **Justification for Granting Relief**

HBRSEP, Unit No. 2, is required to perform inservice examinations of selected welds in accordance with the ASME B&PV Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 1986 Edition with no addenda. This Code invokes Figures IWB-2500-7(a) and IWB-2500-7(b) for volumetric examination requirements of nozzle-to-vessel welds, and also invokes the examination requirements of ASME B&PV Code, Section V, Article 4.

The specified examination volume for reactor pressure vessel (RPV) nozzle-to-vessel welds extends far beyond the weld and heat affected zones into the base metal, and is unnecessarily large. The specified approach requires an unwarranted length of examination time with no corresponding contribution to plant safety. The area specified to be examined includes base metal regions that are not prone to inservice cracking. In accordance with ASME B&PV Code, Section XI, and Regulatory Guide 1.150, Revision 1, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations," the RPV nozzle-to-vessel welds have been subjected to extensive examinations prior to the vessel being placed in service, and during the First and Second Interval Inservice Inspection examinations. Recorded indications during the last examinations were located within the weld material and were within the limits prescribed by ASME B&PV Code, Section XI, IWB-3500, "Acceptance Standards." Additionally, ASME B&PV Code, Section V, Article 4, is considered to represent an outdated examination methodology when compared with the examination techniques available under the PDI Program.

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<sup>1</sup> The PDI is an industry organization comprised of U.S. nuclear utilities that was formed to provide efficient and technically sound implementation of ASME B&PV Code, 1995 Edition, 1996 Addenda, Section XI, Division 1, Appendix VIII.

### **Justification for Granting Relief (Continued)**

ASME Code Case N-613 provides acceptable alternative examination requirements for detection and sizing of surface and subsurface flaws within the examination volume, oriented in a plane normal to the vessel inside surface and parallel to the weld. Implementation of this Code Case is expected to substantially reduce on-vessel examination time, which will result in a corresponding reduction in occupational radiation exposure without compromising examination quality.

HBRSEP, Unit No. 2, intends to perform the required examinations using PDI Program techniques, to the extent practical, in accordance with ASME B&PV Code, Section XI, Division 1, 1995 Edition, 1996 addenda, Appendix VIII. Performing weld examinations in this manner will provide added assurance that RPV nozzle-to-vessel welds have remained free of service-induced flaws, thereby enhancing the quality of examinations and assuring plant safety and reliability.

### **Implementation Schedule**

This relief will be implemented during the HBRSEP, Unit No. 2, Third Ten Year Inservice Inspection Interval. It is requested that this relief be approved by February 1, 2001, to allow implementation during Refueling Outage 20.