North Atlantic

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The Northeast Utilities System

March 31, 2000

Docket No. 50-443

AR# 99004028

NYN-00030

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Seabrook Station
"Reactor Vessel Inspection Alternative and Relief Requests"

North Atlantic Energy Service Corporation (North Atlantic) has provided in Enclosure 1 an alternative request associated with the augmented reactor vessel inspection requirements outlined in 10 CFR 50.55a(g)(6)(ii)(A)(2). Additionally, a request for relief from the requirements of Table IWB-2500-1, Category B-A, Items B1.11 and B1.21 of Section XI of the ASME Boiler and Pressure Vessel Code is provided in Enclosure 2. These requests are submitted for NRC review and approval. North Atlantic completed its volumetric inspection of the reactor vessel for the 1st Ten-Year Inservice Inspection Interval on April 19, 1999 during refueling outage 06 (OR06).

North Atlantic was previously granted relief (IR-1) from the "essentially 100%" volumetric examination coverage the requirements of Section XI of the ASME Boiler and Pressure Vessel Code for the reactor vessel lower head to lower shell circumferential weld 104-141 as outlined in Appendix BB of NUREG-0896 Supplement 9 "Safety Evaluation Report related to the operation of Seabrook Station, Units 1 and 2." However, the portion of this relief request associated with Item Numbers B1.11 and B1.21 was revoked as a result of the rule making (57 FR 34666) associated with the augmented examination requirements for the inspection of reactor vessel shell welds. Since the examination coverage obtained during the OR06 inspection of weld 104-141 was less than the "essentially 100%" criterion specified for the augmented and ASME Section XI inspection requirements, this weld has been included in both requests (Enclosures 1 and 2).

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ASME Code relief request IR-1, also permitted reduced examination coverage (68%) of the reactor vessel lower head circumferential weld 102-151 (Item Number B1.21). However, since the coverage obtained for the subject weld during the OR06 inspection of the reactor vessel was less than the 68% that was previously approved, this weld has been included in the ASME Code relief request (Enclosure 2). Since weld 102-151 is not considered a reactor vessel shell weld, it has not been included in the alternative request (Enclosure 1).

Should you have any questions regarding this letter, please contact Mr. James M. Peschel, Manager - Regulatory Programs, at (603) 773-7194.

Very truly yours,

NORTH ATLANTIC ENERGY SERVICE CORP.

Ted C. Feigenbaum
Executive Vice President
and Chief Nuclear Officer

cc: H. J. Miller, NRC Regional Administrator
R.M. Pulsifer, NRC Project Manager, Project Directorate 1-2
R. K. Lorson, NRC Senior Resident Inspector

ENCLOSURE 1 TO NYN-00030

Seabrook Nuclear Power Station Unit No. 1
Alternative Request

Alternative Request No.

IR-9, Revision 0

Component:

Reactor Vessel Lower Head to Lower Shell Circumferential Weld 104-141

ASME Code Class:

1

ASME Section XI Examination Category:

Table IWB-2500-1 Category B-A, Item No. B1.11 - Circumferential Shell Welds

Regulatory Requirement:

10 CFR50.55a(g)(6)(ii)(A)(2) specifies that for the purposes of this augmented (reactor vessel) inspection, "essentially 100 %" as used in Table IWB-2500-1 means more than 90 percent of the examination volume of each weld, where reduction in coverage is due to interference by another component, or part geometry.

Basis for Request:

10CFR50.55a(g)(6)(ii)(A)(5) identifies that when licensees make a determination that they are unable to completely satisfy the requirements for the augmented reactor vessel shell weld examination specified in 10CFR50.55a(g)(6)(ii)(A) they shall submit information to the Commission to support the determination and shall propose an alternative to the examination requirements that would provide an acceptable level of quality and safety.

The Seabrook Station reactor vessel is a typical 4-loop Westinghouse Pressurized Water Reactor design. Located within the reactor vessel are certain obstructions which may limit the amount of ultrasonic examination coverage that can be achieved for certain welds.

IR-9, Revision 0
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During the volumetric inspection of the reactor vessel for the First Ten-Year Inspection Interval (conducted during the period of April 14, 1999 through April 19, 1999), it was determined that the required "essentially 100 %" inspection coverage for the reactor vessel Lower Head to Lower Shell Circumferential Weld (Weld 104-141) could not be achieved.

Weld 104-141 is situated just below the 6 core support lugs, which are fixed in-place. Each core support lug occupies about 20 degrees of space including the attachment weld. This circumferential weld was completely scanned between the core lugs and the accessible areas below the lugs in both the parallel and perpendicular directions to achieve the maximum coverage. The total scan simple average for the weld is 80% and the total scan simple average for the volume is 73%.

The completion percentage was determined by calculating the percentage of actual coverage versus the total achievable coverage for each examination angle and for each examination direction. This was separated into weld volume and total volume. A weight factor of 0.25 was then applied to the actual percent of coverage for each angle.

Access to weld 104-141 from the outside, was also evaluated and was not considered to be a viable option based on the extremely high person REM dose that would be incurred and the limited access. In order to obtain the required access to weld 104-141 the use of staging, the removal of insulation and the preparation of the surfaces prior to performance of the examination would be required. After completion of the examination the reinstallation of the insulation and the removal of the staging would also be required. It is estimated that the total dose to obtain the additional coverage would be 32 to 38 REM.

Install Staging	4 people	8 hours	32 p/hrs
Insulation Removal	2 people	8 hours	16 p/hrs
Surface preparation	2 people	8 hours	16 p/hrs
Volumetric Examination	2 people	16 hours	32 p/hrs
Reinstall insulation	2 people	8 hours	16 p/hrs
Remove Staging	2 people	8 hours	16 p/hrs
			128 p/hrs@250-300mr/hr = 32 -38R

IR-9, Revision 0
(Continued)

Alternative Examination:

No additional examinations of weld 104-141 will be performed. The coverage that was achieved was the maximum extent practical with the obstructions in place and is representative of the entire weld. Additionally, a VT-3 visual examination was performed on this weld as specified in Table IWB-2500-1, Item B13.10 of the 1983 Edition ASME Section XI. The reactor vessel pressure boundary, which includes the associated welds, was pressure tested each refueling outage as specified in Table IWB-2500-1, Item B15.10. The volume of coverage obtained for weld 104-141 during the reactor vessel inspection combined with the visual examinations and pressure tests performed provides reasonable assurance of the continued structural integrity of the vessel and provides an acceptable level of quality and safety.

ENCLOSURE 2 TO NYN-00030

Seabrook Nuclear Power Station Unit No. 1
Relief Request

Relief Request No.

IR-10, Revision 0

Components:

Reactor Vessel Lower Head to Lower Shell Circumferential Weld (104-141)
Reactor Vessel Lower Head Circumferential Weld (102-151)

ASME Code Class:

1

ASME Section XI Examination Category:

Table IWB-2500-1 Category B-A, Item No. B1.11 - Circumferential Shell Welds
Table IWB-2500-1 Category B-A, Item No. B1.21 - Circumferential Head Welds

ASME Section XI Code Requirements:

1983 Edition (including Addenda through Summer 1983) of Section XI of the ASME Boiler and Pressure Vessel Code:

Table IWB-2500-1 Category B-A, Item No. B1.11 - Circumferential Shell Welds requires that all circumferential shell welds be volumetrically inspected during the 1st Inspection Interval. Note 2 identifies that the inspection include essentially 100% of the weld length.

Table IWB-2500-1 Category B-A, Item No. B1.21 - Circumferential Head Welds requires that the accessible length of all welds be volumetrically inspected during the 1st Inspection Interval. Note 2 identifies that the inspection include essentially 100% of the weld length.

IR-10, Revision 0
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Basis for Request:

North Atlantic has determined that it is impractical to meet the "essentially 100%" of the weld length requirements of Table IWB-2500-1 Category B-A, Item No. B1.11 and B1.21 of the ASME Boiler and Pressure Vessel Code for welds 104-141 and 102-151 respectively.

The Seabrook Station reactor vessel is a typical 4-loop Westinghouse Pressurized Water Reactor design. Located within the reactor vessel are certain obstructions that may limit the amount of ultrasonic examination coverage that can be achieved for certain welds.

During the inspection of the reactor vessel for the First Ten-Year Inspection Interval (conducted during the period of April 14, 1999 through April 19, 1999) it was determined that the required "essentially 100 %" inspection coverage for the reactor vessel Lower Head to Lower Shell Circumferential Weld (Weld 104-141) and Reactor Vessel Lower Head Circumferential Weld (102-151) could not be achieved.

The basis for relief for each weld is identified as follows:

Reactor Vessel Lower Head to Lower Shell Circumferential Weld (104-141)

Weld 104-141 is situated just below the 6 core support lugs, which are fixed in-place. Each core support lug occupies about 20 degrees of space including the attachment weld. This circumferential weld was completely scanned between the core lugs and the accessible areas below the lugs in both the parallel and perpendicular directions to achieve the maximum coverage. The total scan simple average for the weld is 80% and the total scan simple average for the volume is 73%.

The completion percentage was determined by calculating the percentage of actual coverage versus the total achievable coverage for each examination angle and for each examination direction. This was separated into weld volume and total volume. A weight factor of 0.25 was then applied to the actual percent of coverage for each angle.

Reactor Vessel Lower Head Circumferential Weld (102-151)

The lower head circumferential weld is located in elevation at the periphery of the lower head penetrations. The weld was scanned in numerous individual segments between and around the penetrations. The end effector was guided into position by cameras and scanning parameters were established with collision avoidance to maximize coverage. The total scan simple average for the weld is 61% and the total scan simple average for volume is 61%.

IR-10, Revision 0
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The completion percentage was determined by calculating the percentage of actual coverage versus the total achievable coverage for each examination angle and for each examination direction. This was separated into weld volume and total volume. A weight factor of 0.25 was then applied to the actual percent of coverage for each angle.

An ASME Code relief request (IR-1), which permitted reduced examination coverage (68%) for weld 102-151 was previously evaluated and granted for weld 102-151 as identified in Appendix BB of NUREG-0896 Supplement 9 "Safety Evaluation Report related to the operation of Seabrook Station, Units 1 and 2." However, since the minimum committed coverage of 68% was not met, relief for weld 102-151 has been re-submitted. The original determination of coverage was made using a different method.

Access to welds 104-141 and 102-151 from the outside of the reactor vessel, was also evaluated and was not considered to be a viable option based on the extremely high person REM dose that would be incurred and the limited access. In order to obtain the required access to the welds, the use of staging, the removal of insulation and the preparation of the surfaces prior to performance of the examination would be required. After completion of the examination the reinstallation of the insulation and the removal of the staging would also be required. It is estimated that the total dose to obtain the additional coverage for both welds would be 40 to 48 REM.

Install Staging	4 people 8 hours	32 p/hrs
Insulation Removal	2 people 8 hours	16 p/hrs
Surface preparation	2 people 8 hours	16 p/hrs
Volumetric Examination	2 people 16 hours	64 p/hrs
Reinstall insulation	2 people 8 hours	16 p/hrs
Remove Staging	2 people 8 hours	16 p/hrs
		160 p/hrs@250-300mr/hr = 40-48R

Alternative Examination:

No additional examinations of welds 104-141 and 102-151 will be performed. The coverage that was achieved was the maximum extent practical with the obstructions in place and is representative of the entire welds. Additionally, a VT-3 visual examination was performed on these welds as specified in Table IWB-2500-1, Item B13.10 of the 1983 Edition ASME Section XI. The reactor vessel pressure boundary which includes the associated welds were tested each refueling outage as specified in Table IWB-2500-1, Item B15.10. The volume of coverage obtained for welds 104-141 and 102-151 during the reactor vessel inspection combined with the visual examinations and pressure tests performed provides reasonable assurance of the continued structural integrity of the vessel.