North Atlantic

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The Northeast Utilities System

October 26, 2000

Docket No. 50-443

NYN-00091

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

Seabrook Station
"Response to Request for Additional Information Regarding the Second Ten-Year Interval Inservice Inspection Program Relief Requests"

On August 31, 2000, North Atlantic Energy Service Corporation (North Atlantic) forwarded the Second Ten-Year Interval ISI program plan and applicable drawings to the Nuclear Regulatory Commission (NRC) for review. The Second Ten-Year Interval ISI program plan and associated relief requests were developed to meet the requirements of the 1995 Edition (through the 1996 Addenda) of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code.

Due to NRC staff questions regarding relief requests 2IR-2, 2IR-4 and 2IR-12, a telephone conference was held on October 3, 2000. As a result of this telephone conference, North Atlantic agreed to update the subject relief requests to more clearly identify the basis information for individual components in each of the subject relief requests and to include additional basis information as required. Accordingly, the updated relief requests are enclosed.

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

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

Enclosure to NYN-00091

Seabrook Nuclear Power Station Unit No. 1

Relief From Inservice Inspection Requirements

2IR-2, Revision 0

Components For Which Relief Is Requested:

Seven Pressurizer Welds
Three Steam Generator Welds

Component Identification:

RC E-10 01
RC E-10 A-NZ
RC E-10 B-NZ
RC E-10 C-NZ
RC E-10 D-NZ
RC E-10 S-NZ
RC E-10 SP-NZ

RC E-11A SEAM-1
RC E-11A 2A-NZ
RC E-11A 2B-NZ

ASME Code Class:

1

ASME Section XI Examination Category:

Table IWB-2500-1 Category B-B, Item No. B2.11
Table IWB-2500-1 Category B-B, Item No. B2.40
Table IWB-2500-1 Category B-D, Item No. B3.110
Table IWB-2500-1 Category B-D, Item No. B3.130

ASME Section XI Code Requirements:

ASME Section XI, 1995 Edition through the 1996 Addenda, Table IWB-2500-1, Category B-B, Pressure Retaining Welds in Vessels Other Than Reactor Vessels, and Category B-D, Full Penetration Welded Nozzles in Vessels, require examination of essentially 100% of the weld.

North Atlantic has adopted ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds." This Code Case provides the alternative requirement when the entire examination volume or area cannot be examined due to interference by another component or part geometry, a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided the reduction in coverage for that weld is less than 10%.

Basis and Justification for the Granting of Relief:

Pursuant to 10CFR50.55a(g)(5)(iii), North Atlantic has determined that, due to design and geometric configuration, it is impractical to meet the Code required 100% coverage of Section XI or the alternative examination coverage requirements of Code Case N-460 on welds identified in Table 1.

Pressurizer Bottom Head to Shell Weld - RC E-10 01

ASME Section XI, Table IWB-2500-1, Category B-B, requires this weld be examined volumetrically for essentially 100% of the weld length. Weld RC E-10 01 can not be examined for essentially 100% of the weld length due to design (physical obstruction) and geometric configuration. Located just above and below the weld are 8 nonstructural attachments (NB-4435) used during the manufacturing process. Removal of these attachments by grinding is impractical and could negatively effect the Pressurizer vessel. There are also 5 – 1" diameter instrumentation nozzles located 6" above the weld centerline, which limits coverage. In addition, the transition geometry from the lower head to shell further limits coverage. These obstructions and the geometric configuration limited the weld examination volume to 80%. This was the maximum extent achievable during the First Ten-Year Interval.

The Pressurizer bottom head to shell weld is subject to VT-2 visual examination conducted during the system leakage test each refueling outage as specified in Table IWB-2500-1, Examination Category B-P of the 1995 Edition through the 1996 Addenda of ASME Section XI.

North Atlantic believes that previous acceptable results of volumetric examination on 80% of the weld examination volume is representative of the entire weld. Removal of nonstructural attachments to gain examination coverage is impractical and could reduce the level of quality and safety of the Pressurizer vessel. In addition to the volumetric examination, the acceptable results of visual examinations and pressure tests performed each refueling outage provides reasonable assurance of continued structural integrity of this weld, and maintains an acceptable level of quality and safety.

Pressurizer Nozzle Welds – RC E-10 A-NZ, RC E-10 B-NZ, RC E-10 C-NZ, RC E-10 D-NZ, RC E-10 S-NZ, and RC E-10 SP-NZ

As required by ASME Section XI, Table IWB-2500-1, Category B-D, these welds receive a volumetric examination. Nozzle welds RC E-10 A-NZ through RC E-10 SP-NZ have limited coverage due to the nozzle to shell geometry. ISI drawing 1-NHY-650006 shows typical Pressurizer nozzle to stainless steel safe-end weld detail. The transition, from the carbon steel vessel nozzle to the stainless steel safe-end to the stainless steel pipe, is large over a short distance. This causes transducer sound beam propagation angle to change abruptly thereby not fully interrogating the required ASME examination volume. Each nozzle has its own unique fit-up, weld, and finish contour which presents specific individual limitations on examination volume. As depicted in Table 1, these limitations result in coverage from 53% to 77% of total examination volume.

The examination volumes achieved are the maximum extent practical. North Atlantic believes that the achievable examination volumes are representative of the entirety of each weld. ASME Code Category B-D, Item No. B3.110, requires that all Pressurizer nozzle to vessel welds be examined volumetrically. Since all of the nozzles require examination, the probability of finding a flaw is increased. North Atlantic believes that it is impractical grind these transitions or add weld material to increase examination volume. These techniques could decrease the level of quality and safety in the Pressurizer nozzle safe-end welds.

In addition to the limited volumetric examinations, the Pressurizer nozzle to vessel welds are subject to VT-2 visual examination conducted during the system leakage test each refueling outage as specified in Table IWB-2500-1, Examination Category B-P of the 1995 Edition through the 1996 Addenda of ASME Section XI.

North Atlantic believes that previous acceptable results of volumetric examinations of Pressurizer nozzle to vessel welds RC E-10 A-NZ, RC E-10 B-NZ, RC E-10 C-NZ, RC E-10 D-NZ, RC E-10 S-NZ, and RC E-10 SP-NZ, the acceptable results of visual examinations and pressure tests performed each refueling outage provides reasonable assurance of continued structural integrity of these welds, and maintains an acceptable level of quality and safety.

Steam Generator Tubesheet to Head Weld – RC E-11A SEAM-1

As required by ASME Section XI, Table IWB-2500-1, Category B-B, requires this weld be examined volumetrically for essentially 100% of the weld length. Weld RC E-11A SEAM-1 can not be examined for essentially 100% of the weld length due to design (physical obstruction from four steam generator supports). ISI Drawing 1-NHY-650011 shows the four steam generator support pads. These pads are approximately 18" in length and block access to this weld in four locations. These obstructions limit the weld examination volume to 78%. This was the maximum extent achievable.

Five ASME Class 2 girth seam welds on this steam generator have been volumetrically examined during the 1st 10-Yr. ISI Interval. Welds RC E-11A SEAM-2, SEAM-3, SEAM-5, SEAM-6 and SEAM-8 were volumetrically examined and met ASME Code acceptance standards.

In addition to the limited volumetric examination, the Steam Generator tubesheet to head weld is subject to VT-2 visual examination conducted during the system leakage test each refueling outage as specified in Table IWB-2500-1, Examination Category B-P of the 1995 Edition through the 1996 Addenda of ASME Section XI.

North Atlantic believes that previous acceptable results of volumetric examination on 78% of the weld examination volume is representative of the entire weld. In addition to the volumetric examination, the acceptable results of volumetric examination of similar Class 2 girth welds on this steam generator, the acceptable results of visual examinations and pressure tests performed each refueling outage provides reasonable assurance of continued structural integrity of this weld, and maintains an acceptable level of quality and safety.

Steam Generator Primary Nozzle Welds – RC E-11A 2A-NZ and RC E-11A 2B-NZ

As required by ASME Section XI, Table IWB-2500-1, Category B-D, these welds receive a volumetric examination. Welds RC E-11A 2A-NZ and RC E-11A 2B-NZ have limited coverage due to the nozzle to shell geometry and the ID cladding. The small distance between the nozzle and the weld does not provide sufficient room for the ultrasonic transducer to interrogate the Code required volume of these welds. The maximum achievable coverage for both these weld is 84%. The examination volumes achieved are the maximum extent practical. North Atlantic believes that the achievable examination volumes are representative of the entirety of each nozzle weld.

In addition to the limited volumetric examination, the Steam Generator primary nozzle welds RC E-11A 2A-NZ and RC E-11B 2B-NZ are subject to VT-2 visual examination conducted during the system leakage test each refueling outage as specified in Table IWB-2500-1, Examination Category B-P of the 1995 Edition through the 1996 Addenda of ASME Section XI.

North Atlantic believes that previous acceptable results of volumetric examination of the Steam Generator primary nozzle welds RC E-11A 2A-NZ and RC E-11B 2B-NZ, the acceptable results of visual examinations and pressure tests performed each refueling outage provides reasonable assurance of continued structural integrity of this weld, and maintains an acceptable level of quality and safety.

Alternate Examinations

There are no alternate examinations proposed. Volumetric examination of the subject welds will be completed to the maximum extent practical.

Applicability

This Relief Request is applicable to the Second Ten-Year Interval Inservice Inspection Program.

Table 1
Nozzle and Circumferential Welds

Weld Identification	Code Item/number	Limitation	CRV Coverage
RC E-10 01	B 2.11	OD interference and head to shell geometry.	80%
RC E-10 A-NZ	B3.110	Nozzle to shell geometry.	67%
RC E-10 B-NZ	B3.110	Nozzle to shell geometry.	55%
RC E-10 C-NZ	B3.110	Nozzle to shell geometry.	53%
RC E-10 D-NZ	B3.110	Nozzle to shell geometry.	77%
RC E-10 S-NZ	B3.110	Nozzle to shell geometry.	63%
RC E-10 SP-NZ	B3.110	Nozzle to shell geometry.	72%
RC E-11A SEAM-1	B 2.40	Steam generator supports.	78%
RC E-11A 2A-NZ	B 3.130	Nozzle to shell geometry.	84%
RC E-11A 2B-NZ	B 3.130	Nozzle to shell geometry.	84%

Components For Which Relief Is Requested:

Excess Letdown Heat Exchanger Shell Circumferential Weld (CS E-3 C)
Steam Generator Main Steam Outlet Nozzle Inner Radius (RC E-11A 16-IR)

ASME Code Class:

2

ASME Section XI Examination Category:

Table IWC-2500-1 Category C-A, Item No. C1.10 - Shell Circumferential Welds
Table IWC-2500-1 Category C-B, Item No. C2.22 – Nozzle Inside Radius Section

ASME Section XI Code Requirements:

ASME Section XI, 1995 Edition through the 1996 Addenda, Table IWC-2500-1 Category C-A, Item No. C1.10 - Shell Circumferential Welds requires that circumferential shell welds at gross structural discontinuities be volumetrically examined. Note 1 identifies that the examinations include essentially 100% of the weld length.

ASME Section XI, 1995 Edition through the 1996 Addenda, Table IWC-2500-1 Category C-B, Item No. C2.22 – Nozzle Inside Radius Section requires that the inner radius sections of all nozzles at terminal ends of piping runs be volumetrically examined.

Basis and Justification for the Granting of Relief:

Excess Letdown Heat Exchanger Shell Circumferential Weld (CS E-3 C)

Pursuant to 10CFR50.55a(g)(5)(iii), North Atlantic has determined that due to design and geometry, the examination requirement of "essentially 100%" of the weld length as specified in Table IWC-2500-1 Category C-A, Item No. C1.10 for weld CS E-3 C is impractical to meet. The examination coverage of this weld is limited to 43% due to vessel head to flange geometry and permanent physical obstruction. As depicted on drawing 1-NHY-650000, the heat exchanger head is directly welded to a flange. The inlet and outlet connections are located on the head, but adjoin the weld. This creates a limitation such that the transducers can only scan from the head side of the weld and can only cover the area between the inlet and outlet connections.

Coverage for Excess Letdown heat exchanger weld CS E-3 C was conducted to the maximum extent practical with the design geometry and obstructions in place and we believe is representative of the entire weld. This weld is also subject to VT-2 visual examination each inspection period as specified in Table IWC-2500-1, Examination Category C-H of the 1995 Edition through the 1996 Addenda of ASME Section XI. The coverage obtained on this weld and the associated pressure testing performed provides reasonable assurance of continued structural integrity of this weld.

Steam Generator Main Steam Outlet Nozzle Inner Radius (RC E-11A 16-IR)

Pursuant to 10CFR50.55a(g)(5)(iii), North Atlantic has determined that due to design and geometry, the volumetric examination requirement for nozzle inside radius sections of all nozzles at terminal ends of piping runs as specified in Table IWC-2500-1 Category C-B, Item No. C2.22 for weld RC E-11A 16-IR is impractical to meet. The steam generator main steam outlet nozzle is somewhat typical of a dropout nozzle, which is welded to the head. It is unlike a forged dropout, which has an inner radius transition. The main steam outlet nozzle contains a flow limiter device within the bore of the nozzle. This device makes a square transition to the nozzle making it ultrasonically impractical to examine and hence the 0% coverage assigned.

The steam generator main steam outlet nozzle weld (RC E-11A 16-NZ) receives a volumetric and surface examination as specified in Table IWC-2500-1, Examination Category C-B of the 1995 Edition through the 1996 Addenda of ASME Section XI. Volumetric coverage of this weld is greater than 90%, which is considered full coverage in accordance with Code Case N-460. Code Case N-460 is approved for use in Regulatory Guide 1.147 and included in the Seabrook Station 2nd Ten-Year Interval ISI Program. Surface examination coverage of this weld is 100%. In addition, a VT-2 examination associated with the system pressure test is performed on this weld each inspection period as specified in Table IWC-2500-1, Examination Category C-H of the 1995 Edition through the 1996 Addenda of ASME Section XI. The full volumetric examination coverage, the 100% surface examination coverage, and visual examination associated with the system pressure test conducted on the nozzle weld provide reasonable assurance of continued structural integrity for RC E-11A 16-IR.

Alternative Examination:

No alternative examination for weld CS E-3 C is proposed.

No alternate examination of inner radius section RC E-11A 16-IR is proposed.

Applicability:

This Relief Request is applicable to the Second Ten-Year Interval Inservice Inspection Program.

Seabrook Nuclear Power Station Unit No. 1

Relief From Inservice Inspection Requirements

2IR-12, Revision 0

Components For Which Relief Is Requested:

Four Pressurizer Welded Attachments

Component ID No:

RC E-10 A-LUG
RC E-10 B-LUG
RC E-10 C-LUG
RC E-10 D-LUG

ASME Code Class:

1

ASME Section XI Examination Category:

Table IWB-2500-1 Category B-K, Item No. B10.10

ASME Section XI Code Requirements:

ASME B&PV Code Section XI, 1995 Edition through the 1996 Addenda, Table IWB-2500-1, Examination Category B-K requires surface examination of each pressure vessel welded attachment.

Basis and Justification for the Granting of Relief:

Pursuant to 10CRF50.55a(g)(5)(iii), relief is requested from performing the surface examination on the four Pressurizer welded attachments on the basis that the Code requirement is impractical to achieve.

A 15" thick concrete shield wall weighing approximately 85,000 pounds surrounds the Seabrook Station Pressurizer approximately three quarters of the way around. The clearance between the shield wall and the Pressurizer vessel is approximately 9½". The north end of the cubicle has greater vessel to shield wall clearance, but is where safety valve and spray piping run. Ladders or platforms do not exist to make the examination area accessible nor can any ladders be placed due to restrictions by piping, conduit and other attachments.

The Pressurizer lugs are located on the Pressurizer at elevation 23'-6". Potential access is gained by climbing a ladder on the outside of the shield wall and entering the cubicle at the top of the Pressurizer at elevation 50'. Safety valve structural steel is used for footing as no platform exists in the cubicle. The North Atlantic Safety Department evaluated the lack of normal and emergency access/egress as an unsafe work environment.

In addition to area inaccessibility, each lug is braced on two sides with large structural elements, which would require removal. Insulation is also wrapped around the lugs and structural steel. Tools and rigging equipment to remove the lug braces would be required to provide 360 degrees of access on each lug. Inaccessibility and removal of the lug braces is impractical without a compensating increase in quality and safety.

These attachments are subject to VT-2 visual examination as part of the system leakage test on the Pressurizer vessel conducted each refueling outage as specified in Table IWB-2500-1, Examination Category B-P of the 1995 Edition through the 1996 Addenda of ASME Section XI.

North Atlantic believes that it is impractical to provide normal and emergency access/egress inside this highly restricted enclosure, and remove structural steel braces on these lugs to perform a surface examination without a compensating increase in quality and safety. North Atlantic also believes that based on acceptable results of VT-2 visual examinations performed during system leakage tests, and no known or published adverse examination results within the nuclear industry on attachments in ASME Code Category B-K, Item B10.10, there is reasonable assurance of continued structural integrity of the subject attachments and an acceptable level of quality and safety is maintained.

Alternative Examination:

No alternative examination is proposed for these welded attachments.

Applicability

This Relief Request is applicable to the Second Ten-Year Interval Inservice Inspection Program.