



**North
Atlantic**

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The Northeast Utilities System

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Docket No. 50-443

NYN-01052

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

Seabrook Station
“Inservice Inspection Program Alternative and Relief Requests
for ASME Section XI Requirements”

North Atlantic Energy Service Corporation (North Atlantic) hereby submits in Enclosure 1, three alternative requests and one relief request associated with the Inservice Inspection (ISI) Program requirements as stated within Section XI of the 1995 Edition (including the 1996 Addenda) of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code.

As a result of a review associated with the ISI program, North Atlantic is requesting relief from certain ASME Code requirements as follows:

- Alternative request 2AR-03 requests Nuclear Regulatory Commission (NRC) approval to utilize ASME Code Case N-566-1, “Corrective Action for Leakage Identified at Bolted Connections” as an alternative to the requirements of IWA-5250(a)(2) for ASME Code Class 1,2, and 3 bolting.
- Alternative request 2AR-04 requests NRC approval to utilize ASME Code Case N-616, “Alternative Requirements for VT-2 Visual Examination of Classes 1, 2, and 3 Insulated Pressure Retaining Bolted Connections” as an alternative to the requirements of IWA-5242(a) for examination categories B-P, C-H, and D-B.
- Alternative request 2AR-05 requests NRC approval to utilize ASME Code Case N-623, “Deferral of Inspections of Shell-to-Flange and Head-to-Flange Welds of a Reactor Vessel,” as an alternative to the scheduling requirements for the Reactor Pressure Vessel Shell-to-Flange and Head-to-Flange welds contained in Examination Category B-A, “Pressure Retaining Welds in Reactor Vessel.”
- Relief request 2IR-14 requests NRC approval to use best available techniques from the accessible side of welds for components with single side access that are subject to ultrasonic examination with Supplement 2 of Appendix VIII to the 1995 Edition (including the 1996 Addenda) of ASME Section XI.

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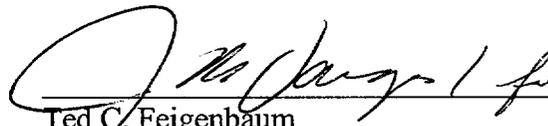
The NRC has evaluated and approved an alternative request similar to 2AR-03 for use at Millstone Nuclear Power Station, Unit 3 (dated July 24, 2000; TAC No. MA5446). The NRC has evaluated and approved an alternative request similar to 2AR-04 for use at Diablo Canyon Nuclear Power Plant, Units 1 and 2 (dated October 19, 2000; TAC Nos. MA9202 and MA9203). The NRC has evaluated and approved an alternative request similar to 2AR-05 for use at Millstone Nuclear Power Station, Unit 3 (dated August 28, 2000; TAC No. MA8275). A relief request similar to 2IR-14 for use at Millstone Nuclear Power Station, Units 2 and 3 (dated August 25, 2000) is currently undergoing NRC review.

NRC review and approval of the subject relief requests is requested by January 31, 2002 to support inspection activities that are planned during the upcoming refueling outage that is scheduled to begin in May 2002.

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 Region I Administrator
G. F. Wunder, NRC Project Manager, Project Directorate I-2
G.T. Dentel, NRC Senior Resident Inspector

ENCLOSURE 1 TO NYN-01052

Seabrook Nuclear Power Station, Unit No. 1
Alternative To Inservice Inspection Requirements

2AR-03, Revision 0

Sheet 1 of 2

Subject:

Code Case N-566-1, Corrective Action for Leakage Identified at Bolted Connections

ASME Code Class:

1, 2, and 3

Code Requirement for which Alternative Is Requested:

ASME Boiler and Pressure Vessel (B&PV) Code Section XI, 1995 Edition through the 1996 Addenda, paragraph IWA-5250(a)(2) states that if leakage occurs at a bolted connection on other than a gaseous system, one of the bolts shall be removed, 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.

Basis and Justification for Granting the Alternative:

Pursuant to 10CRF50.55a(a)(3)(ii), authorization is sought to utilize ASME Code Case N-566-1 as an alternative to the requirements specified in the ASME B&PV Code Section XI, 1995 Edition through the 1996 Addenda, Paragraph IWA-5250(a)(2).

A number of problems have been identified with this Code requirement:

- IWA-5250(a) directs that a VT-3 be performed on the removed bolt in accordance with IWA-3100. IWA-3100 does not contain acceptance criteria for VT-3 of bolting.
- The Code does not require that the leakage be stopped; therefore, after pulling and examining the bolt, the leakage may continue.
- Removing one bolt at a time, the leakage may become even worse than originally found.
- The Code does not address integrity of the joint.
- Bolts can be damaged when being removed.
- The Code requires removing the bolting even if the leakage is minor, can be monitored, or if there is no corrosion concern. This can impact startup, impact personnel safety, cause hardship, and increase radiation exposure without a commensurate increase in safety.

A Special Task Group within the ASME B&PV Code Section XI Subcommittee has addressed through-wall and mechanical joint leakage. They have concluded that structural integrity does not imply leak tightness. IWB-3142.4 allows acceptance of relevant conditions by analytical evaluation. It is felt that this can be applied to leakage from mechanical connections.

Seabrook Nuclear Power Station, Unit No. 1
Alternative To Inservice Inspection Requirements

2AR-03, Revision 0

Sheet 2 of 2

It is the North Atlantic position that compliance with the existing ASME Code requirement results in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The proposed alternative in the Code Case provides a level of quality and safety equivalent to other components evaluated under IWB-3142.4.

Proposed Alternative:

The alternative rules set forth in Code Case N-566-1 such that:

- (a) The leakage shall be stopped, and the bolting and component material shall be evaluated for joint integrity as described in (c) below.
- (b) If the leakage is not stopped, the joint shall be evaluated in accordance with IWB-3142.4 for joint integrity. This evaluation shall include the considerations listed in (c) below.
- (c) The evaluation of (a) and (b) above is to determine the susceptibility of the bolting to corrosion and failure. This evaluation shall include the following:
 - 1. the number and service age of the bolts;
 - 2. bolt and component material;
 - 3. corrosiveness of process fluid;
 - 4. leakage location and system function;
 - 5. leakage history at the connection or other system components;
 - 6. visual evidence of corrosion at the assembled connection.

If the evaluation determines that examination is required, the bolt closest to the leak will be removed and VT-1 examined. The bolt will be evaluated in accordance with IWB-3517.1 of the ASME B&PV Code Section XI, 1995 Edition through the 1996 Addenda.

Alternative Request Applicability

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

Seabrook Nuclear Power Station, Unit No. 1
Alternative To Inservice Inspection Requirements

2AR-04, Revision 0

Sheet 1 of 2

Subject:

Code Case N-616, Alternative Requirements for VT-2 Visual Examination of Classes 1, 2, and 3 Insulated Pressure Retaining Bolted Connections

Components for which the Alternative is Requested

Class 1, 2, and 3 pressure retaining bolted connections when the bolting is resistant to boric acid degradation.

Examination Category

B-P, C-H, and D-B

Code Requirement for which Alternative Is Requested:

1995 Edition, 1996 Addenda of the ASME Boiler and Pressure Vessel (B&PV) Code Section XI:

Table IWB-2500-1 requires the Class 1 connections be VT-2 examined each refueling outage. Tables IWC-2500-1 and IWD-2500-1, for Class 2 and 3 connections respectively, require that Class 2 and 3 connections be VT-2 examined each inspection period.

Subparagraph IWA-5242(a): "For systems borated for the purpose of controlling reactivity, insulation shall be removed from pressure retaining bolted connections for VT-2 visual examination."

Basis and Justification for Granting the Alternative:

Pursuant to 10CRF50.55a(a)(3)(i), authorization is sought to utilize ASME Code Case N-616 as an alternative to the requirements specified in the ASME B&PV Code Section XI, 1995 Edition through the 1996 Addenda, Subparagraph IWA-5242(a). It is the North Atlantic position that the use of Code Case N-616 for VT-2 visual examination without the removal of insulation when the bolting material is resistant to boric acid degradation provides an acceptable level of quality and safety. Corrosion resistant bolted connections on borated systems consist of materials with chromium content greater than or equal to 10%, which are resistant to boric acid degradation. The basis for a minimum chromium content being used as a measure of susceptibility to degradation is established in Code Case N-616. During the last refueling outage OR07, Class 1 bolted connections were inspected with insulation removed in accordance with IWA-5242(a) and North Atlantic Alternative Request 2AR-01 (Code Case N-533). Where boric acid residues were discovered and corrosion resistant bolting removed, no degradation was evident on the bolting material. These results were consistent with expectations that no boric acid corrosion degradation mechanism exists on the corrosion resistant materials.

Seabrook Nuclear Power Station, Unit No. 1
Alternative To Inservice Inspection Requirements

2AR-04, Revision 0

Sheet 2 of 2

North Atlantic contends that unnecessary physical hazard and radiation exposure exists to personnel in erecting and removing scaffolding, and removing and reinstalling insulation at nominal operating pressures and elevated temperatures.

North Atlantic conducts pressure tests utilizing a four-hour hold time on systems borated for the purpose of controlling reactivity. This commitment was made to the NRC and published in safety evaluation dated October 17, 2000, TAC NO. MA8991. The four-hour hold time prior to examination is also included in this alternative request.

Proposed Alternative:

North Atlantic will implement ASME Code Case N-616 for performance of VT-2 visual examination at locations where corrosion resistant bolting is installed without removal of the insulation. The following restrictions will apply to those locations where this alternative request is used:

1. A four-hour hold time at system NOP will be utilized prior to examination.
2. This alternative request will not apply to:
 - (a) AISI Type 17-4 stainless steel (SA-564 Grade 630) bolting that was not aged at a temperature of 1100 °F or higher.
 - (b) AISI Type 410 stainless steel (SA-193 Grade 6) bolting that was not aged at a temperature of 1100 °F or higher.
 - (c) A-286 stainless steel (SA-453 Grade 660) that is preloaded to greater than 100 ksi.
3. Use of Code Case N-616 will also only apply to bolted connections where the associated piping, valve bodies, and pump casings contain a minimum of 10% chromium.

If evidence of leakage is detected at locations where corrosion resistant bolting material is used, either by discovery of active leakage or evidence of boric acid crystals, the insulation will be removed and the bolted connection will be reexamined. If necessary, the bolted connection will be evaluated in accordance with the corrective measures of subarticle IWA-5250, as modified by North Atlantic Alternate Request 2AR-03 (Code Case N-566-1, pending NRC approval).

Alternative Request Applicability

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

Seabrook Nuclear Power Station, Unit No. 1
Alternative To Inservice Inspection Requirements

2AR-05, Revision 0

Sheet 1 of 2

Subject:

Code Case N-623, Deferral of Inspections of Shell-to-Flange and Head-to-Flange Welds of a Reactor Vessel

Components for which the Alternative is Requested

Code Class 1, Category B-A, Pressure Retaining Welds in Reactor Vessel, Item No. B1.30, Shell-to-Flange Weld and Item No. B1.40, Head-to-Flange Weld.

Code Requirement for which Alternative Is Requested:

Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code, 1995 Edition through the 1996 Addenda, Table IWB-2500-1, Category B-A requires that the reactor pressure vessel (RPV) shell-to-flange weld be volumetrically examined once each inspection interval and the RPV head-to-flange weld be surface and volumetrically examined once each inspection interval. The footnotes to the Table provide partial deferrals for both of these welds, but in no case are they allowed to be totally deferred to the end of the interval.

Basis and Justification for Granting the Alternative:

Pursuant to 10CRF50.55a(a)(3)(i), authorization is sought to utilize ASME Code Case N-623 as an alternative to the requirements specified in the ASME B&PV Code Section XI, 1995 Edition through the 1996 Addenda.

Code Case N-623 provides an alternative to the examination scheduling requirements for the RPV shell-to-flange and head-to-flange welds contained in Examination Category B-A, "Pressure Retaining Welds in Reactor Vessel". Currently, these examinations may be partially deferred to the end of a 10-year Inservice Inspection (ISI) Interval, but total deferral is not allowed. Code Case N-623 provides an option to the Owner for total deferral of these weld examinations provided three basic conditions are met:

1. No welded repair/replacement activities have ever been performed on the shell-to-flange or head-to-flange weld;
2. Neither the shell-to-flange weld nor the head-to-flange weld contains identified flaws or relevant conditions that currently require successive inspections in accordance with IWB-2420(b); and
3. The vessel is not in the first inspection interval.

Seabrook Nuclear Power Station, Unit No. 1

Alternative To Inservice Inspection Requirements

2AR-05, Revision 0

Sheet 2 of 2

North Atlantic is presently in its second interval for the ISI program. During the first interval ISI, neither the shell-to-flange weld nor the head-to-flange weld contained identified flaws or relevant conditions that required successive inspections in accordance with IWB-2420 (b). In preparation for the 10-year RPV examination, a weld map was obtained depicting fabrication radiographic weld repair locations. Both the shell-to-flange and the head-to-flange welds had no documented repair areas. In addition, these welds have not been subject to repair/replacement activities during the first interval. As a result, North Atlantic meets these conditions for Seabrook Station.

Total deferral of these examinations to the end of the inspection interval would allow the RPV ultrasonic examinations to be scheduled, in aggregate, at the same time and would result in a significant burden reduction with no change to the examination methods or techniques required under the 1995 Edition through the 1996 Addenda of Section XI.

Performing ultrasonic examination of RPV welds at one time, on a specific RPV, will improve reliability and reproducibility of ultrasonic examinations since the procedures and techniques utilized on the population of welds will be at a uniform level of technology. The experience to date indicates that examinations performed on these shell-to-flange and head-to-flange welds have not identified any detrimental flaws or relevant conditions and that changing the schedule for examining these welds in aggregate at the end of successive 10-year intervals should provide an equivalent indication of the RPV integrity for a specific RPV. Therefore, it is the North Atlantic position that this request meets the provisions of 10CFR50.55a(a)(3)(i) as providing an acceptable level of quality and safety.

Proposed Alternative:

The alternative rules set forth in Code Case N-623

Alternative Request Applicability

This Alternative 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-14, Revision 0

Sheet 1 of 2

Components for which Relief Is Requested:

Components with single side access, subject to ultrasonic examination with Supplement 2 of Appendix VIII to the 1995 Edition through the 1996 Addenda of ASME Section XI.

ASME Code Class:

1 and 2

ASME Section XI Examination Category:

Table IWB-2500-1 Category B-J, Item No. B9.10 and Item No. B9.30
Table IWC-2500-1 Category C-F-1, Item No. C5.10 and Item No. C5.20

Code Requirement:

10CFR50.55a(b)(2)(xv)(A), requires the following examination coverage when applying Supplement 2 to Appendix VIII:

- (1) "Piping must be examined in two axial directions and when examination in the circumferential direction is required, the circumferential examination must be performed in two directions, provided access is available."

- (2) "Where examination from both sides is not possible, full coverage credit may be claimed from a single side for ferritic welds. Where examination from both sides is not possible on austenitic welds, full coverage credit from a single side may be claimed only after completing a successful single sided Appendix VIII demonstration using flaws on the opposite side of the weld."

10CFR50.55a (b)(2)(xvi)(B) requires that "examinations performed from one side of a ferritic or stainless steel pipe weld must be conducted with equipment, procedures, and personnel that have demonstrated proficiency with single side examinations. To demonstrate equivalency to two sided examinations, the demonstration must be performed to the requirements of Appendix VIII as modified by this paragraph and paragraph 50.55a(b)(2)(xv)(A)."

Seabrook Nuclear Power Station, Unit No. 1
Relief From Inservice Inspection Requirements
2IR-14, Revision 0

Sheet 2 of 2

Basis and Justification for the Granting of Relief:

Pursuant to 10CFR50.55a(g)(6)(i), relief is requested from the new examination coverage and qualification demonstration requirements for austenitic piping welds with single side access. 10CFR50.55a requires that if access is available, the weld shall be scanned in each of the four directions (parallel and perpendicular to the weld) where required. Coverage credit may be taken for single side exams on ferritic piping. However, for austenitic piping, a procedure must be qualified with flaws on the inaccessible side of the weld. There are currently no qualified single side examination procedures that demonstrate equivalency to two-sided examination procedures on austenitic piping welds. Current technology is not capable of reliably detecting or sizing flaws on the far side of an austenitic weld for configurations common to US nuclear applications.

The Performance Demonstration Initiative (PDI) Program conforms to 10CFR50.55a regarding single side access for piping. PDI Performance Demonstration Qualification Summary (PDQS) certificates for austenitic piping list the limitation that single side examination is performed on a best effort basis. The best effort qualification is provided in place of a complete single side qualification to demonstrate that the examiners qualification and the subsequent weld examination is based on application of the best available technology.

When the examination area is limited to one side of an austenitic weld, examination coverage does not comply with 10CFR50.55a(b)(2)(xv)(A) and proficiency demonstrations do not comply with 10CFR50.55a(b)(2)(xvi)(B) and full coverage credit may not be claimed.

Proposed Alternative Examinations

The best available techniques, as qualified through the PDI for Supplement 2 with demonstrated best effort for single side examination, will be used from the accessible side of the weld.

North Atlantic will document the affected austenitic welds for which best effort single sided exams are encountered on form NIS-1, Owner's Report for Inservice Inspections submitted in accordance with IWA-6240(b).

Applicability

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