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January 14, 2010

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

Serial No. 09-782  
NSSLWDC R0  
Docket No. 50-423  
License No. NPF-49

**DOMINION NUCLEAR CONNECTICUT, INC.**  
**MILLSTONE POWER STATION UNIT 3**  
**RELIEF REQUEST IR-3-05 RESPONSE TO REQUEST FOR ADDITIONAL**  
**INFORMATION REGARDING PROPOSED ALTERNATIVE RELATED TO**  
**INSERVICE INSPECTION OF WELD OVERLAYS FOR THE THIRD 10-YEAR**  
**INTERVAL**

As a part of the inservice inspection (ISI) program, Dominion Nuclear Connecticut, Inc. (DNC) submitted relief request IR-3-05 for Millstone Power Station Unit 3 (MPS3) in a letter dated April 28, 2009. IR-3-05 requests relief from certain examination requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, and proposes alternative examination criterion for the third 10-year inservice inspection (ISI) interval at MPS3. Specifically, IR-3-05 pertains to the ISI of Alloy 82/182 dissimilar metal piping welds and adjacent similar metal welds which have had a full structural weld overlay applied at MPS3. In a letter dated December 10, 2009, the NRC transmitted a request for additional information (RAI). The NRC requested that DNC respond to the RAI by January 15, 2010.

Attachment 1 provides the DNC response to the NRC RAI addressing questions 1 through 11. Attachment 2 provides a revision to Relief Request IR-3-05 (Revision 1), to include changes resulting from the response to the NRC RAI questions.

If you should have any questions regarding this submittal, please contact Wanda Craft at (804) 273-4687.

Sincerely,

A handwritten signature in black ink, appearing to read "L. Hartz".

Leslie N. Hartz  
Vice President – Nuclear Support Services

Attachments:

1. Relief Request IR-3-05 response to request for additional information regarding proposed alternative related to inservice inspection of weld overlays for the third 10-year interval.
2. Revision 1 of Relief Request IR-3-05, proposed alternative related to inservice inspection of weld overlays for the third 10-year interval.

Commitments made in this letter:

1. None

cc: U.S. Nuclear Regulatory Commission  
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**ATTACHMENT 1**

**RELIEF REQUEST IR-3-05**  
**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING**  
**PROPOSED ALTERNATIVE RELATED TO INSERVICE INSPECTION OF WELD**  
**OVERLAYS FOR THE THIRD 10-YEAR INTERVAL**

**DOMINION NUCLEAR CONNECTICUT, INC.**  
**MILLSTONE POWER STATION UNIT 3**

By letter dated April 28, 2009 (Agencywide Document Access and Management System Accession (ADAMS) No. ML091310666), Dominion Nuclear Connecticut, Inc. (DNC) submitted Relief Request IR-3-05 for Millstone Power Station Unit 3 (MPS3). The April 28, 2009 letter requested relief from certain examination requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, and proposed alternative examination criterion for the third 10-year inservice inspection interval at MPS3. In a letter dated December 10, 2009, the NRC transmitted a request for additional information (RAI). The following is the response to the RAI questions:

**NRC QUESTION 1:**

IR-3-05 references the ISI for the weld overlay that was performed in accordance with approved relief requests IR-2-39 (ADAMS Accession No. ML053260012). However, no details of the nondestructive examination were provided. Please discuss the details of the ultrasonic examinations that were performed as noted above. Please include details of any indications detected including fabrication flaws and/or flaws that were not rejectable under IWB-3514 acceptance standards.

**DNC RESPONSE:**

Ultrasonic examination of the weld overlay was performed in accordance with ASME Section XI, 1995 Edition with the 1996 Addenda, Appendix VIII, Supplement 11 with approved alternatives to comply with the Performance Demonstration Initiative (PDI) Program using PDI qualified personnel, equipment and procedures. No flaws were detected.

**NRC QUESTION 2:**

The ASME Task Group on Alloy 600 and the NRC staff are in agreement that the appropriate dimensions for Figure 2(b) from ASME Code Case N-770, which is utilized in IR-3-05 as Figure 1(b), shall be equivalent to the nominal thickness of the nozzle end preparation or the pipe being overlaid, as appropriate. Please meet the dimensions described above or provide justification for the current dimensions.

**DNC RESPONSE:**

Following the issuance of ASME Code Case N-770, the NRC provided questions to the ASME Task Group on Alloy 600 (TGA600). As a result of reviewing and discussing those questions, N-770 was revised. This revision to the Code Case (N-770-1), which

occurred after the initial submittal of IR-3-05, has not yet been published. In it, TGA600 revised Figures 2(a) and 2(b). DNC agrees to incorporate the revised figures into IR-3-05, Rev. 1 as Figures 1(a) and 1(b), respectively.

**NRC QUESTION 3:**

The ASME Task Group on Alloy 600 and the NRC staff are in agreement that for each overlay in the 25 percent sample that has a design life of less than 10 years, at least one inservice examination shall be performed prior to exceeding the life of the overlay. Please provide the calculated life of the weld overlays addressed in IR-3-05. Additionally, please revise paragraph 5.1 of IR-3-05 to reflect this update, or provide a justification for not revising paragraph 5.1.

**DNC RESPONSE:**

The Pressurizer Surge nozzle to safe-end weld 03-X-5551-X-T has a design life of 13 years. The Pressurizer Safety and Relief nozzle to safe-end welds 03-X-5644-A-T, 03-X-5648-B-T, 03-X-5649-C-T and 03-X-5650-D-T and the Pressurizer Spray nozzle to safe-end weld 03-X-5641-E-T have a design life of 40 years. Since none of the full structural weld overlays addressed by Relief Request IR-3-05 has a design life of less than 10 years, the requirement to perform at least one inservice examination prior to exceeding the life of the overlay was determined to be non-applicable and not included in paragraph 5.1 of the relief request.

**NRC QUESTION 4:**

Paragraph 5.2 of IR-3-05 mimics footnote 10 from Code Case N-770; however, the last sentence of footnote 10 was omitted in IR-3-05. Please address this omission and/or revise IR-3-05 accordingly. Consistent with question three above, please provide the mitigation evaluation period and confirm that those welds not included in the 25% sample will be examined prior to the end of the mitigation evaluation period/life of the overlay.

**DNC RESPONSE:**

As stated in IR-3-05, paragraph 5.1, each weld overlay was examined once during the first or second refueling outage following application of the weld overlay. As such, the requirement of the last sentence of footnote 10 was already met (i.e., all welds were examined prior to the end of the mitigation period) and, therefore, inclusion of the requested examination commitment was deemed unnecessary.

**NRC QUESTION 5:**

Please address whether or not welds categorized as Nonmandatory Appendix R, Table R-2500-1, Examination Category R-A, Item Number R1.15 will be re-classified to Item Number R1.20 as a result of application of the weld overlays.

**DNC RESPONSE:**

The subject welds will be reclassified as R1.20 for the third 10-Year interval.

**NRC QUESTION 6:**

Please address the omission of the discussion in Paragraph -3132.1(b) of Code Case N-770 on acceptability for continued service of a weld with planar surface flaws in the butt welds or base metal inside surface.

**DNC RESPONSE:**

Since the welds in question are structural weld overlays, the inner surface is not available for interrogation by ultrasonic examination. Because of this, a surface flaw in the butt weld inside surface will not be detected (the requirement is to examine the structural weld overlay and the outer 25% of the base metal/butt-weld interface). Therefore, the discussion of Paragraph -3132.1(b) of Code Case N-770 on acceptability for continued service of a weld with planar surface flaws in the butt welds or base metal inside surface is not applicable to Relief Request IR-3-05.

**NRC QUESTION 7:**

Please address the discrepancy between IR-3-05 Paragraph 5.4.2.1.3 and Code Case N-770 paragraph -3132.1(c) related to the location of the flaw either in the butt weld or base metal inside surface.

**DNC RESPONSE:**

Since the welds in question are structural weld overlays, the inner surface is not available for interrogation by ultrasonic examination. Because of this, a surface flaw in the butt weld inside surface will not be detected (the requirement is to examine the structural weld overlay and the outer 25% of the base metal/butt-weld interface). Therefore, the discussion of Paragraph -3132.1(c) of Code Case N-770 related to the location of the flaw either in the butt weld or base metal inside surface is not applicable to relief request IR-3-05.

**NRC QUESTION 8:**

Please address the omission of Code Case N-770, Paragraph -3132.3(a) regarding continued service if an analytical evaluation meets the requirements of IWB-3600 and additional examinations are performed during the current outage.

**DNC RESPONSE:**

The words in Code Case N-770, Paragraph -3132.3(a) regarding continued service if an analytical evaluation meeting the requirements of IWB-3600 and additional examinations are performed during the current outage was not omitted, but rather relocated slightly for clarity in Relief Request IR-3-05. These words reside in 5.4.2.3.2, which states (in part), "A weld overlay whose volumetric examination detects planar flaw growth or new planar flaws that exceed the acceptance standards of IWB-3514 is acceptable for continued service without repair/replacement activity if the weld overlay meets the acceptance criteria of IWB-3600 and the additional examinations of 5.4.3 are performed."

**NRC QUESTION 9:**

Regarding Paragraph -3132.3(b) of Code Case N-770, the ASME Task Group on Alloy 600 is expected to revise the language of the latter half of the paragraph, as shown in italics as follows: "Previously-evaluated flaws that were mitigated by the techniques identified in Table 1 need not be reevaluated nor have additional successive or additional examinations performed *if new planar flaws have not been identified or the previously evaluated flaws have remained essentially unchanged.*"

IR-3-05, paragraph 5.4.2.3.1 reflects the current wording in Paragraph -3132.3(b) of Code Case N-770, "Previously-evaluated flaws that were mitigated by the techniques identified in Table 1 need not be reevaluated nor have additional successive or additional examinations performed if the size difference is within the measurement accuracy of the NDE technique employed."

Please explain how you plan on determining if the size difference is within the measurement accuracy of the NDE technique employed or revise paragraph 5.4.2.3.1.

**DNC RESPONSE:**

As discussed earlier, following the issuance of N-770, the NRC provided questions to TGA600. As a result of reviewing and discussing those questions, N-770 was revised. This revision to the Code Case (N-770-1) occurred after the initial submittal of IR-3-05 and has not been published yet. The change in wording has been implemented in N-770-1, with concurrence from the NRC representative on TGA600. The purpose of this

change is to remove ambiguity and make the Code Case consistent with ASME Section XI language regarding “essentially unchanged”. DNC agrees with this change and is changing the wording of 5.4.2.3.1 to reflect the clarification.

**NRC QUESTION 10:**

Paragraph 5.4.2.3.2 of IR-3-05 has omitted text contained in Code Case N-770 paragraph -3132.3(d), which addresses reexamination in accordance with Table 1 of Code Case N-770. Please address this omission.

**DNC RESPONSE:**

Because IR-3-05 only addresses two categories in Code Case N-770 (Inspection Item C, Uncracked butt weld reinforced by full structural weld overlay of Alloy 52/152 material and Inspection Item F, Cracked butt weld reinforced by full structural weld overlay of Alloy 52/152 material), Table 1 was not used. All the applicable requirements have been incorporated into the text of IR-3-05 including the requirement to continue to reexamine the welds once per interval. Because IR-3-05 requires the first examination during the first or second refueling outage following application of the weld overlay (regardless of whether the underlying butt weld was cracked or uncracked), and then once per interval thereafter for a 25% sample, the proposed IR-3-05 exceeds the requirements of Table 1 for reexamination of uncracked butt welds reinforced by full structural weld overlays of Alloy 52/152 material, and meets the requirements of N-770 Table 1 for cracked butt welds reinforced by full structural weld overlays of Alloy 52/152 material.

**NRC QUESTION 11:**

To be consistent with Code Case N-770, the last word of Paragraph 5.4.3.2 of Relief Request IR-3-05 should read “outage” rather than “interval.” Please justify or revise.

**DNC RESPONSE:**

The Relief Request has been revised to change the last word of Paragraph 5.4.3.2 to “outage” rather than “interval”.



**ATTACHMENT 2**

**REVISION 1 OF RELIEF REQUEST IR-3-05, PROPOSED ALTERNATIVE RELATED  
TO INSERVICE INSPECTION OF WELD OVERLAYS FOR THE THIRD 10-YEAR  
INTERVAL**

**DOMINION NUCLEAR CONNECTICUT, INC.  
MILLSTONE POWER STATION UNIT 3**

**10 CFR 50.55a Request Number IR-3-05  
Revision 1**

**Proposed Alternative  
In Accordance with 10 CFR 50.55a(a)(3)(i)**

--Alternative Provides Acceptable Level of Quality and Safety--

**1. ASME Code Components Affected**

ASME Code Class: Code Class 1

References: WCAP 14572, Revision 1-NP-A,  
Second Interval Relief Requests IR-2-39 and IR-2-47

Examination Category: R-A

Item Numbers: R1.11 (Safe End-to-Pipe Welds)  
R1.20 (Nozzle-to-Safe End Welds)

Description: Examination of Weld Overlays

Components: Dissimilar Metal Piping Welds with Alloy 82/182 Weld Metal and  
Adjacent Welds which have had a Full Structural Weld Overlay  
Applied. See Below for List of Welds.

1. Weld No. 03-X-5551-X-T: Weld overlay encapsulating Pressurizer surge nozzle-to-safe end dissimilar metal weld and the adjacent safe end-to-pipe weld (Weld No. RCS-SL-FW-4).
2. Weld No. 03-X-5641-E-T: Weld overlay encapsulating Pressurizer spray nozzle-to-safe end dissimilar metal weld and the adjacent safe end-to-pipe weld (Weld No. RCS-517-FW-12).
3. Weld No. 03-X-5644-A-T: Weld overlay encapsulating Pressurizer safety nozzle at 81° azimuth-to-safe end dissimilar metal weld and the adjacent safe end-to-pipe weld (Weld No. RCS-516-FW-1)
4. Weld No. 03-X-5648-B-T: Weld overlay encapsulating Pressurizer safety nozzle at 147° azimuth-to-safe end dissimilar metal weld and the adjacent safe end-to-pipe weld (Weld No. RCS-516-FW-3)
5. Weld No. 03-X-5649-C-T: Weld overlay encapsulating Pressurizer safety nozzle at 212° azimuth-to-safe end dissimilar metal weld and the adjacent safe end-to-pipe weld (Weld No. RCS-516-FW-5)
6. Weld No. 03-X-5650-D-T: Weld overlay encapsulating Pressurizer relief nozzle at 278° azimuth-to-safe end dissimilar metal weld and the adjacent safe end-to-pipe weld (Weld No. RCS-513-FW-1)

**2. Applicable Code Edition and Addenda**

ASME Section XI, 2004 Edition (No Addenda)

**10 CFR 50.55a Request Number IR-3-05, Rev 1**  
(continued)

**3. Applicable Code Requirement**

The inservice inspection of the subject welds was initially performed in accordance with ASME Section XI, IWB-2500, Examination Categories B-F and B-J.

An alternative to the ASME Section XI requirements for the inservice inspection of Class 1 piping, Category B-J and B-F welds was implemented during the second interval based on the Risk-Informed technology developed in accordance with the Westinghouse Owners Group Topical Report "WCAP 14572, Revision 1-NP-A". The request to use this alternative was submitted to the Nuclear Regulatory Commission on July 25, 2000 with approval received on March 12, 2002.

During the second interval, full structural weld overlays were applied to the subject welds. Inservice inspection for the weld overlays was performed in accordance with approved relief requests IR-2-39 (for Weld No. 03-X-5641-E-T) and IR-2-47 (for the remainder of the listed weld overlays).

**4. Reason for Request**

Currently, there is no comprehensive criteria for a licensee to perform inservice examination of weld overlays applied as a repair or for preemptive measures due to susceptibility of the underlying weld to PWSCC.

The applications of the weld overlays at MPS3 were one time Relief Requests in the second interval based on the guidance of Code Case N-504-2 for Relief Request IR-2-39 and Code Case N-740 for Relief Request IR-2-47. For the third interval, the subsequent examination of the weld overlays needs to be considered. DNC proposes to combine the examination criteria for the weld overlays identified in Relief Requests IR-2-39 and IR-2-47 into a one examination criteria as described below.

**5. Proposed Alternative and Basis for Use**

- 5.1 Each weld overlay has been examined once during the first or second refueling outage following application of the weld overlay. The weld overlay examinations showed no indication of crack growth or new cracking and will be placed into a unique population within the ISI Program to be examined on a sample basis. Twenty-five percent of this population shall be added to the ISI Program as new welds in accordance with IWB-2412(b).
- 5.2 The 25% sample shall consist of the same welds in the same sequence during successive intervals to the extent practical (note that all welds experience pressurizer temperatures).
  - 5.2.1 These examinations may be deferred to coincide with the vessel nozzle examinations required by Category B-D.
  - 5.2.2 Examinations during future intervals may be deferred to the end of the interval, provided no additional repair/replacement activities have been performed on the examination item, and no flaws or relevant conditions requiring successive examination in accordance with Attachment 1 are contained in the mitigated weld.

**10 CFR 50.55a Request Number IR-3-05, Rev 1**  
(continued)

- 5.3 The examinations shall be volumetric (ultrasonic) and shall meet the applicable requirements of Appendix VIII. The requirements for the examination volume and required thicknesses shall be as described in Attachment 1, Figures 1(a) “Examination Volume in Full Structural Weld Overlays” and 1(b) “Definition of Thickness  $t_1$  and  $t_2$  for Application of IWB-3514 Acceptance Criteria.”
- 5.4 Acceptance Criteria
- 5.4.1 General
- 5.4.1.1 The volumetric examinations shall be evaluated by comparing the examination results with the acceptance standards in 5.4.2.
- 5.4.1.2 Volumetric examination results shall be compared with recorded results of the preservice examination and prior inservice examinations. Acceptance of welds for continued service shall be in accordance with 5.4.2.
- 5.4.2 Acceptance
- 5.4.2.1 Acceptance by Volumetric Examination
- 5.4.2.1.1 A weld whose volumetric examination confirms the absence of flaws shall be acceptable for continued service.
- 5.4.2.1.2 Flaws shall meet the acceptance standards of IWB-3514 or be accepted for continued service in accordance with 5.4.2.2 or 5.4.2.3.
- 5.4.2.1.3 A weld with new planar surface flaws or unexpected or unacceptable growth of existing flaws shall be accepted for continued service in accordance with the provisions of 5.4.2.2 or 5.4.2.3.
- 5.4.2.2 Acceptance by Repair/Replacement Activity
- 5.4.2.2.1 A weld whose volumetric examination reveals a flaw not acceptable for continued service in accordance with the provisions of 5.4.2.3 is unacceptable for continued service until the additional examinations of 5.4.3 are satisfied and the weld is corrected by repair/replacement activity in accordance with IWA-4000.
- 5.4.2.2.2 For weld overlay examination volumes (Figure 1(a)) with unacceptable indications in accordance with 5.4.2.3.2, the weld overlay shall be removed, including the original defective weld, and the weld shall be corrected by repair/replacement activity in accordance with IWA-4000.
- 5.4.2.3 Acceptance by Evaluation
- 5.4.2.3.1 Previously-evaluated flaws that were mitigated by the full structural weld overlay of Code Case N-770 Table 1 need not be reevaluated nor have additional successive or additional examinations performed if new planar flaws have not been

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(continued)

identified or the previously evaluated flaws have remained essentially unchanged.

- 5.4.2.3.2 A weld overlay whose volumetric examination detects planar flaw growth or new planar flaws that exceed the acceptance standards of IWB-3514 is acceptable for continued service without repair/replacement activity if the weld overlay meets the acceptance criteria of IWB-3600 and the additional examinations of 5.4.3 are performed. If a planar flaw is detected in the outer 25% of the original weld/base metal thickness for the examination volume it is acceptable for continued service if the crack growth calculations and structural design and sizing calculations required for original weld overlay acceptance show or are revised to show acceptability of the detected flaw. Any indication in the weld overlay material characterized as stress corrosion cracking is unacceptable.

5.4.3 Additional Examinations

- 5.4.3.1 Examinations of additional weld overlays during the current outage are required if unacceptable planar flaws are detected in the weld overlay thickness, or if this examination reveals crack growth into the examination volume larger than predicted by the previous 5.4.2.3 analysis. The number of additional weld examinations shall be equal to the number of overlaid welds originally scheduled to be performed during the present inspection period.
- 5.4.3.2 If the additional examinations required by 5.4.3.1 reveal unacceptable flaws (5.4.2.3.2), the remaining weld overlays shall be volumetrically examined during the current outage.

**6. Duration of Proposed Alternative**

This relief is requested for the duration of the Third Inservice Inspection Interval, which began on April 23, 2009, and is scheduled to end on April 22, 2019.

**7. Precedents**

This is a first time request and DNC knows of no known examples of licensees applying to use the criteria in N-770 for the inservice inspection of weld overlays at this time. This request is being submitted because of the need to apply consistent examination requirements for weld overlays within the Third Inservice Inspection Interval. The alternative requirements proposed in this request are derived from those in Code Case N-770, "Alternative Examination Requirements and Acceptance Standards for Class 1 PWR Piping and Vessel Nozzle Butt Welds Fabricated with UNS N06082 or UNS W86182 Weld Filler Material With or Without Application of Listed Mitigation Activities, Section XI, Division 1." Code Case N-770 has been approved by ASME (ASME C&S Connect Record No. 08-9). Only those requirements pertinent to the inservice inspection of full structural weld overlays were used (Code Case N-770, Table 1, Item F).

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(continued)

**8. References**

- 8.1 2004 Edition, No Addenda, ASME Code, Section XI.
- 8.2 ASME Code Case N-770, “Alternative Examination Requirements and Acceptance Standards for Class 1 PWR Piping and Vessel Nozzle Butt Welds Fabricated with UNS N06082 or UNS W86182 Weld Filler Material With or Without Application of Listed Mitigation Activities, Section XI, Division 1” (Approved by ASME January 26, 2009).
- 8.3 Dominion Request for Relief IR-2-39, Revision 1 “Use of Weld Overlay and Associated Alternative Repair Techniques”, dated October 19, 2005, ADAMS Accession No. ML052930108
- 8.4 NRC Letter, “Millstone Power Station Unit No. 3 – Issuance of Relief from Code Requirements (TAC NO. MC8609)”, dated January 20, 2006 , ADAMS Accession No. ML053260012
- 8.5 Dominion Request for Relief IR-2-47, Revision 1 “Use of Weld Overlay as an Alternative Repair Technique”, dated March 28, 2007 , ADAMS Accession No. ML070880565
- 8.6 NRC Letter, “Request for Approval to Use IR-2-47 for Dissimilar Metal Weld Overlays as an Alternative Repair Technique (TAC NO. MD3379)”, dated May 3, 2007 , ADAMS Accession No. ML071210024

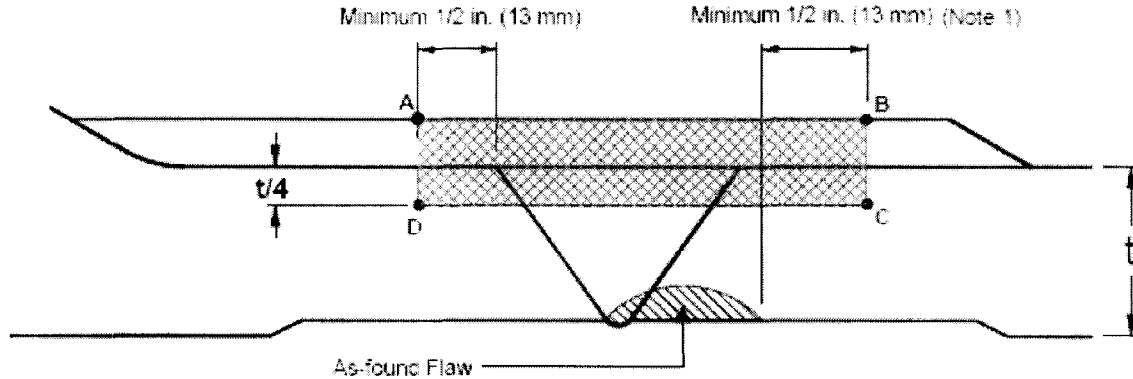
**10 CFR 50.55a Request Number IR-3-05**  
**Attachment 1**

**Inservice Inspection Requirements For Full Structural Weld Overlay.**

(Figures 1(a) and 1(b) are shown on the next page.)

- (a) The weld overlay examination volume in Fig. 1(a) shall be ultrasonically examined to determine the acceptability of the weld overlay and to determine if any new or existing cracks have propagated into the outer 25% of the original weld or base material or into the overlay. The angle beam shall be directed perpendicular and parallel to the piping axis, with scanning performed in four directions.
- (b) The weld overlay shall meet the inservice examination standards of IWB-3514. In applying the acceptance standards to planar indications, the thickness  $t_1$  or  $t_2$ , defined in Fig. 1(b), shall be used as the nominal wall thickness in IWB-3514, provided the base material beneath the flaw (i.e., safe end, nozzle, or piping material) is not susceptible to PWSCC. For susceptible material,  $t_1$  shall be used. If the acceptance standards of IWB-3514 cannot be met, the weld overlay shall meet the acceptance standards of IWB-3600. Any indication characterized as stress corrosion cracking in the weld overlay material is unacceptable.
- (c) As an alternative to (a), for inservice inspection, the weld examination volume in ASME Section XI, Figure IWB-2500-8(c) may be ultrasonically examined. If cracking is detected extending beyond the weld examination volume, the weld examination of (a) and (b) above shall be performed to determine the acceptability of the weld overlay.
- (d) If inservice examinations of (a), (b), or (c) reveal crack growth, or new cracking in the weld overlay or outer 25% of original weld/base material meeting the acceptance standards, the weld overlay examination volume shall be reexamined during the first or second refueling outage following discovery of the crack growth or new cracking. The weld overlay examination volume shall be subsequently examined two additional times at the period of one or two refueling outages, i.e., a total of 3 examinations within 6 refueling outages.
- (e) If the examinations required by (d) reveal that the flaws remain essentially unchanged for three successive examinations, the weld examination schedule may revert to the sample and schedule of examinations identified in 5.1.

Fig. 1(a): Examination Volume in Full Structural Weld Overlays



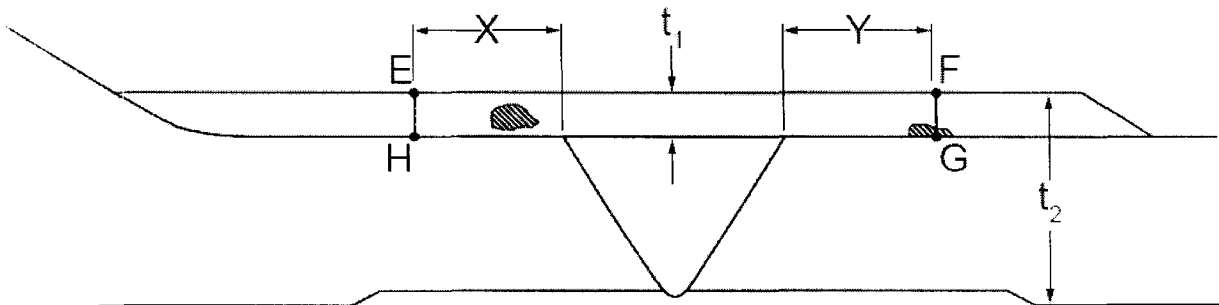
Examination Volume A-B-C-D

GENERAL NOTE: The weld includes the nozzle or safe end butter where applied.

**NOTE:**

- (1) For axial and circumferential flaws, the axial extent of the examination volume shall extend at least ½ in. (13 mm) beyond the as-found flaw and at least ½ in. (13 mm) beyond the toes of the original weld, including weld end butter, where applied, plus any PWSCC-susceptible base material in the nozzle and safe-end.

Fig. 1(b): Definition of Thickness  $t_1$  and  $t_2$  for Application of IWB-3514 Acceptance Standards



**NOTES:**

- (a) Dimension “x” or “y” is equivalent to the nominal thickness of the nozzle end preparation or the pipe, respectively, being overlaid.
- (b) The nominal wall thickness is  $t_1$  for flaws in E-F-G-H and  $t_2$  for flaws outside E-F-G-H.
- (c) For flaws that are in E-F-G-H and extend outside this volume, the thickness of  $t_1$  shall be used.
- (d) The weld includes the nozzle or safe end butter, where applied, plus any PWSCC-susceptible base material in the nozzle and safe-end.