RIDS received 10/14/04 (JW)

From: <Raymond_A_West@dom.com>
To: <wen@nrc.gov>
Date: 10/1/04 2:54PM
Subject: Comment Letter on Code Case N-323-1 re: [DG-1126] and [10CFR50.55a(b)(2)(xxi)(C)

8/3/04
69FR46598
(3)

Wally:

During the ASME Section XI meeting of the Subgroup on Water Cooled Systems (SGWCS) held on September 1, 2004, in New Orleans, LA, I voted negative on SGWCS Item # 04-07. This action was titled "A Proposed Revision to Code Case N-323-1 and a Change to Table IWB-2500-1, Category B-K," that was being presented to resolve the current restrictions that the NRC Staff has placed on this Code Case in Reg. Guide 1.193 / DG-1126 and the corresponding referenced Code requirements in the regulations under 10CFR50.55a(b)(2)(xxi)(C). During the meeting I volunteered to supply a written "Public Comment" regarding these restrictions. Attached, as I said I would, is my written comment letter under the first PDF file and attachments to that letter in the next three PDF files. My negative vote on this action was centered on my objection to changing these requirements in light of the 30 plus years of acceptable service for vessel-welded attachments and the information that is contained in my comment letter. Additionally, I have cc'd this "e-mail" to the members of the Working Group on Inspection of Systems and Components (WGISC), SGWCS, and other Section XI members for their information. Please accept this letter for consideration of a possible change to the NRC Staff position on these restrictions. I hope this letter makes a difference.

Thanks,
Ray

(See attached file: DG-1126 Comment ltr.pdf) (See attached file: Code Case N-323-1.pdf) (See attached file: Code Case N-323.pdf)(See attached file: BASIS FOR N-509.pdf)

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E-RIDS = ADM-03
Add = W. Norris (WEN)

Template = ADM-013

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Subject: Comment Letter on Code Case N-323-1 re: [DG-1126] and [10CFR50.55a(b)(2)(xxi)(C)
Creation Date: Fri, Oct 1, 2004 2:52 PM
From: <Raymond_A_West@dom.com>

Created By: Raymond_A_West@dom.com

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Files	Size	Date & Time
MESSAGE	1649	Friday, October 1, 2004 2:52 PM
DG-1126 Comment ltr.pdf	39386	
Code Case N-323-1.pdf	63189	
Code Case N-323.pdf	57052	
BASIS FOR N-509.pdf	63141	
Mime.822	309721	

Options

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Priority:	Standard
Reply Requested:	No
Return Notification:	None
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Security:	Standard

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October 1, 2004

Attn: W. E. Norris (301) 415-6796
Rules and Directives Branch
DAS, Office of Administration,
U.S. Nuclear Regulatory Commission,
Washington, DC 20555-0001

Subject:

Comment On The Acceptability Of ASME Code Case N-323-1 and Corresponding Requirements In ASME Code Section XI, 1997 Addenda, re: [DG-1126] and 10CFR50.55a(b)(2)(xxi)(C)

Attachments:

(1) ASME Code Case N-323-1, Alternative Examination for Welded Attachments to Pressure Vessels Section XI Division 1, *Approval Date:* December 31, 1996

Code Case N-323-1.pdf

(2) ASME Code Case N-323, Alternative Examinations for Integrally Welded Attachments to Vessels Section XI, Division 1, *Approval Date:* September 16, 1981

Code Case N-323.pdf

Please note that the information provided below is considered to be a "Public Comment," based on my personal opinion and is not to be considered the opinion of the ASME.

Dear Mr. Norris:

The attached background information to this letter provides support for my comment below concerning the removal of the unacceptable status of Attachment (1) **ASME Code Case N-323-1, *"Alternative Examination for Welded Attachments to Pressure Vessels, Section XI, Division 1,"*** listed in **Draft Regulatory Guide DG-1126, (Proposed Revision 1 to Regulatory Guide 1.193), ASME Code Cases Not Approved For Use.**

The statement of unacceptability for the use of this Case is listed in DG-1126, on Page 6, as follows: ***"This Code Case was reinstated, but modified from the original Code Case. The revised Code Case would permit surface examinations from the accessible side, which are of limited value. Volumetric examination of the Class 1 integrally welded***

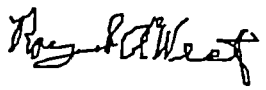
attachment from the accessible side is practical and must be performed to adequately determine the condition of the weld."

Additionally, since this Case has been incorporated into the ***ASME Code, Section XI, 1997 Addenda, a similar limitation on the use of these same Code requirements in Table IWB-2500-1, Examination Category B-K, Item No. B10.10, of this 1997 Addenda and later Editions and Addenda is currently in place under the Code of Federal Regulations in 10CFR50.55a(b)(2)(xxi)(C).***

Although, my comment is similar to those that have been sent to the Staff in regards to other revisions of Reg. Guides 1.147/1.193 and the use of this Code Case along with those presented in regards to the limitation in the regulations, I would like to make the following statement: ***There are many components in a nuclear power plant where it may be practical to perform certain examinations, but that does not mean that there is value added for those examinations. The impact on the public health and safety must also include those personnel that are tasked to perform these examinations and any effort that can be made to reduce radiation exposure to these personnel must also be considered.***

Comment For Consideration: These vessel-welded attachments (vessel support skirt welds) that are the subject of Code Case N-323-1, and the current ASME Code Section XI, Table IWB-2500-1, Examination Category B-K requirements for inservice inspection, are robust in design, and have demonstrated a low failure potential by satisfactory performance without any degradation for over 30 years of nuclear plant operating experience. In fact, these welds, although subject to a perceived high consequence of failure, if a failure would occur, because they are attached to major plant components (i.e., Boiling Water Reactor (BWR) Reactor Pressure Vessels, Pressurized Water Reactor (PWR) Pressurizers and Combustion Engineering (CE) Steam Generators) are of little concern due to their excellent service history. For at least one of the designs covered by these requirements the vessel's pressure boundary integrity could be challenged if a crack were to occur and go completely through the vessel wall, but this is highly unlikely and the surface examination requirements contained in this Code Case and the ASME Code would identify this problem before it could occur. This is because such potential propagation would be very slow requiring years. Thus, these welds do not warrant the increased level of examination (i.e., a volumetric examination) that is being forced on the industry by the NRC Staff and have not warranted such an examination since the development of Code Case N-323-1. Due to this extensive operating experience which has been recognized by the ASME Code, the unacceptability status of Code Case N-323-1, and the limitation in the regulations for these same welds under 10CFR50.55a(b)(2)(xxi)(C) does not provide a substantial increase in the level of public health and safety, but increases the burden on Licensees in costs and personnel radiation exposure, and therefore should both be removed.

Sincerely,



Raymond A. West

1.0 ASME Code History

- Originally, the 1971 Edition of ASME Section XI, Examination Category H, specified a visual and volumetric examination for these vessel-welded attachments that included the weld and the base metal beneath the weld and along the support attachment member for a distance of two base metal thicknesses. The examination was to be performed once each 10-year interval and would include at least 10% of the linear weld to the vessel.

  No examination figures existed at this time and it was clear that the inclusion of the base metal beneath the weld was to look for flaws in the vessel from this weld that could affect the pressure boundary integrity of the vessel. The weld design that these requirements seemed to be centered on is the same as that depicted in Figure 1 of Code Case N-323-1, because the pressure boundary integrity of the vessel would not be affected by the failure of the weld in Figure 2.

- In the 1974 Edition of ASME Section XI, the Examination Category for vessel-welded attachments became B-H, the specified welds were described as vessel support skirt welds, and the welds no longer required a visual examination, but still required volumetric examination of the same volume with a minor change to the wording associated with the extent of examination. Instead of 10% of the linear length of the weld the words were changed to 10% of the circumference of the weld to the vessel.

  Still no examination figures existed and it is believed that the weld design for which these requirements was centered on was based on that design depicted in Figure 1 of Code Case N-323-1. It still seemed clear that the pressure boundary integrity of the vessel was the reason that this examination was being performed. Additionally, this was the time frame that the 1976 Addendas were published and not approved by the NRC. One of the main reasons for the disapproval of these Addendas was that the NRC wanted all pressure boundary welds to be examined for 100% of their weld length or circumference. At the time, the NRC believed that this increase would have no significant impact on the industry because all these welds would eventually be examined using automated techniques and so Section XI, succumbed to the NRC, and accepted the 100% requirement. Regardless of whether this decision was right or wrong, vessel-welded attachments were now included as part of this 100% requirement and they are still predominantly being examined with manual techniques today.

- Next, with the publication of the 1977 Edition of ASME Section XI, it contained significant changes to the requirements associated with vessel-welded attachments. Examination Category B-H now required that these welds be either volumetrically or surface examined for 100% of the length of the weld as explained above. Examination Figures IWB-2500-13 and IWB-2500-14 were added to show the required volume for volumetric examination and the surface area for surface examinations. These two Figures depicted the two typical weld designs associated with vessel support skirt welds. Examinations of these welds became limited to the first and second 10-year inspection intervals only.

  What this change meant along with the expanded 100% length requirement was that after 20 years of operation these welds would never require inservice inspection (ISI) again. This was the first sign where the Code recognized that if you hadn't identified a problem with these welds in 20 years then the examinations should no longer be needed. Figure IWB-2500-13 (same as Figure 1 from Code Case N-323-1) only required a surface examination from the accessible side of the weld. Additionally, with the new Figure IWB-2500-14 (same as Figure 2 from Code Case N-323-1) you could see that the failure concern had expanded from the

original vessel pressure boundary integrity concern to also include one associated with the failure of the support attachment weld itself.

- Then with the publication of the Winter 1978 Addenda of ASME Section XI, a new weld examination selection philosophy began with the inclusion of stress criteria for piping weld examinations. No changes were made to Examination Category B-H items at this time.

  Although, this stress selection criteria was not incorporated into the Code for vessel-welded attachments, this was the time frame that the development of Code Case N-323 began. It was this new philosophy that was used to incorporate the service limit requirements and usage factor requirements into the original Code Case N-323 Attachment (2).

- Next, in the Winter 1981 Addenda of ASME Section XI, the Figures IWB-2500-13 and IWB-2500-14 were revised to show an examination surface area on the inside portion of the attachment weld. This is the side of the weld on the inside of the skirt support to a vessel that is normally inaccessible (not actually inaccessible, but very difficult to examine due to personnel access, exposure, heater penetrations on pressurizers, the truncated cone design on CE steam generators, and control rod drives on BWR vessels), but the examination requirements from Examination Category B-H still remained volumetric or surface, as applicable.

  Only based on some discussion with a colleague that has been involved with the Code for many years was I able to put together why these inside diameter examination requirements came about for support skirt welds. It was his belief, that at the time, these requirements came from some individuals who did not appreciate the fact that the inside surface of these support skirt welds were always in compression. These individuals just thought that these welds should be treated just like all other pressure boundary welds. It was that simple thought process that probably got these requirements included into the Code.

- During this same time frame the original Code Case N-323 was published on September 16, 1981, and it contained the similar figures to IWB-2500-13 and IWB-2500-14 with no volumetric examination volume identified and allowed a surface examination from the accessible side of the weld provided that the service and usage factor requirements were met in the Case.

- In the Winter 1982 Addenda of ASME Section XI, the Figures IWB-2500-13 and IWB-2500-14 that showed examination areas and volumes were changed. The examination requirements were still volumetric or surface, as applicable, in Examination Category B-H, but the description of the volumetric examination volume that was on Figure IWB-2500-14 was put into Note (4) of the B-H Table and the surface examination was shown on each Figure to be on both sides of the weld.

  The stress examination selection criteria of Code Case N-323 was never added to the Code because over the next 10 years failures that were occurring with piping welds were resulting from material and environmental conditions affecting that material such as Intergranular Stress Corrosion Cracking (IGSCC) in BWRs and the Code was revisiting whether stress was really the best basis to be using for weld examination selection criteria.

- Next on April 30, 1990, the original Code Case N-323 was annulled and the reason cited for the annulment was that the Case was not needed any longer.

A review of ADAMS for relief requests associated with the use of Code Case N-323 produced only a limited number of hits. None reflected the actual use of this version of the Case. I know from my own experience that at least one relief request was granted to use the Case for the 1st 10-year interval on a pressurizer support skirt weld, but I can only assume that the Code Case N-323 was not widely used because of the conservative service limits and usage factor requirements. Most of these welds would exceed those limits and that did not allow most BWRs or PWRs to use the Case.

- Up until the 1992 Addenda of ASME Section XI was published, no changes were made to the Examination Category B-H requirements. With the publication of this Addenda Table IWB-2500-1 changed the examination method from "volumetric and surface, as applicable" to "surface", but Note (4) still remained in place and this was simply an editorial action.

  So lets review the situation at this time, which was around 1992. (1) The original requirements for vessel-welded attachments included the affect of the attachment welds on the vessel pressure boundary integrity, but that could only be applicable to the weld design that was later depicted as Figure 1 in Code Case N-323-1 and Figure IWB-2500-13 in the Code; (2) Examinations had now been expanded to include the entire length of the weld; (3) The examination requirements now required a surface examination on both sides of a vessel-welded attachment and could be replaced on at least one design that later was depicted as Figure 2 in Code N-323-1 and Figure IWB-2500-14 in the Code with a volumetric examination from one side of the weld; (4) Stress criteria was never incorporated into the Code from Code Case N-323, because it was to conservative and was not shown to be a good criteria for weld examination selection; and (5) The examinations were no longer required for plants in their 3rd 10-year inspection interval and beyond.

- In 1992, I began an effort to develop a Code Case that was later published as Code Case N-509, Alternative Rules for the Selection and Examination of Class 1, 2, and 3, Integrally Welded Attachments, Section XI, Division 1. As part of this Code Case vessel-welded attachments were moved from Examination Category B-H to Examination Category B-K. The examination requirements for these vessel-welded attachments did not change from the 1992 Edition of ASME Section XI. However, the basis for the development of Code Case N-509, using service experience, formed a large part of the basis for Code Case N-323-1 and its eventual incorporation into the ASME Code Section XI, 1997 Addenda. The following attached file is the basis document presentation given to the ASME Code Committees for Code Case N-509 and the Code Case was published on May 11, 1994.

BASIS FOR N-509.pdf

The results of the work that went into supporting the development of Code Case N-509 showed that welded attachments were not failing from service generated degradation. Over 20 years of plant operating experience supported this conclusion. The failures that had occurred were from plant operational transients (i.e., water hammers) and the attachments just broke. There were no identified conditions of weld cracking being found by ISI prior to these failures. There had only been one case of an attachment weld failure that resulted in pressure boundary leakage and that was due to a support design problem on a Class 2

support with a 1/8" lug welded to a thin wall schedule 10s pipe. The only reason welded attachments continued to receive ISI examinations as a result of this work was for Defense–in-Depth considerations. The exemption from examination for all Class 1 welded attachments, including vessel-welded attachments, after the 1st and 2nd 10-year intervals was removed. Now all welded attachments required some sample examinations every 10-year interval. Only a minimum 10% sample was required for welded attachment examinations. For vessel-welded attachments, only one attachment weld was required to be examined on a single vessel because it didn't matter which welded attachment got examined and that was based solely on Defense-in-Depth. This requirement was later changed to require the loaded attachment on a vessel (i.e., the vessel support skirt weld) to be the one selected for examination and should be published in the 2004 Edition. Code Case N-509, was approved for use by the NRC Staff in Reg. Guide 1.147, Revision 12, with a condition that at least a 10% sample of each item in each Code Class should be examined each inspection interval. Finally, today, the Code Case has been annulled and has been incorporated into Section XI.

- On April 5, 1993 a written request came to the ASME to reinstate Code Case N-323, as one plant, a BWR, decided that they could meet the service limits and usage factor requirements of the Case and wanted to use the Case to allow a surface only examination from the accessible side of their reactor vessel support skirt weld. The responsible committee began work on the action to reinstate the Code Case.

  The ASME Code Committees worked on this effort for three years. The revision of the Code Case N-323-1 did change from the original version, but not without considering all of the information above. The Committee considered that the real reason that these welds were being examined was due to Defense-in-Depth. The history now showed over 25 years of operating experience and nothing was being found in these welds. Therefore, the requirements in the Code Case were relaxed to still provide an examination that would show if the welds were in fact cracked, but more importantly to have the least impact on a Licensee from a cost and radiation exposure perspective by giving them the option of volumetric or surface examinations. This was done with full consideration for the health and safety of the public, including the personnel performing these examinations.

- On December 31, 1996, Code Case N-323-1 was published and it was incorporated into the ASME Code Section XI, in the 1997 Addenda.

  After these rules were published the NRC Staff placed Code Case N-323-1 in an unacceptable status and limited the use of the requirements for vessel-welded attachment examinations in the regulations and thus it's these restrictions that are the subject of this letter.

2.0 Degradation Susceptibility And Examination Discussion

- The vessel-welded attachments that are the subject of this letter are sometimes positively stressed, and are often under compression. The usage factor is generally above 0.1 for these types of welds, but such a value only validates that the analysis may have been done to crude and simplistic to justify a lower value. The stresses on these supports come from normal design loads and thermal expansion during normal heatup and cool down of the vessels to which they are attached. Typically the vessel shell expands and contracts under these normal operating conditions and forces the support skirt out and

down and then back to its cold position again. Note for description purposes the inside surface of the support skirt is essentially inaccessible and the outside surface of the support skirt is accessible.

- For the weld design depicted in Figure 1 of Code Case N-323-1, where the weld is directly attached to the vessel wall, the only location expected for a crack to occur could be on the outside surface of the support skirt weld, in the weld heat affected zone, because the inside surface is in compression. So when examining the outside of the weld, the worst case for this type of weld would be for a crack to occur on the vessel side of the weld, because it could threaten the vessel's pressure boundary integrity. With this being the case, one would expect that a surface examination in this area would be sufficient to detect this type of a crack. This is the type of NDE prescribed for this weld in Code Case N-323-1 and the 1997 Addenda and later Editions and Addenda of ASME Section XI, and also has been required in several past versions of the Code.

- Next, for the weld design depicted in Figure 2 of Code Case N-323-1, the same type of crack could occur and it would also be on the outside surface of the support because the inside is again in compression. However, the affect of a crack in this weld would not result in a loss of pressure boundary integrity because it would not affect the vessel directly, and therefore, it is not as critical as the design depicted in Figure 1. If a crack does occur in this weld, it could be completely through the support skirt wall in localized areas, but nothing would happen to affect the function of the support skirt from holding up the vessel. Because of this situation, it should not be a requirement to volumetrically examine this weld just because it is considered to be practical by the opinion of the NRC Staff. Either a surface examination or a volumetric examination from the accessible side of this weld would be adequate to determine the level of degradation that would need to be identified for its unacceptability.

After attaining the information for the write-up in this section and reviewing the Code history above, I find it hard to understand the basis for the NRC's statement of unacceptability regarding the use of Code Case N-323-1 and the 1997 Addenda requirements of ASME Section XI. Based on the loadings on the vessel support skirt welds, it is hard to imagine a failure mode that would result in a catastrophic failure. If a crack went through the support skirt, the vessel would just sit there. If a crack went through the vessel wall, it would leak, but it would not "zipper," and the vessel would still just sit there. Additionally, since the inside surface of a typical support skirt is in compression and the outside is in tension, cracks should not occur on the inside surface of the subject welds. Because this is my understanding of the information available regarding the examination requirements for vessel-welded attachments it leaves me only one question for the NRC Staff and that question is as follows:

Why is a volumetric examination necessary to determine the adequate condition of these welds?

3.0 Conclusion

With the background information that I have provided above, it should be much clearer to the NRC Staff just what is needed for the ISI requirements associated with vessel-welded attachments. Because of this information I would like to request that the NRC Staff review my comment and consider revising their current position on the acceptability of Code

Case N-323-1 and the ASME Code Section XI, 1997 Addenda and later Editions and Addenda regarding the ISI requirements for vessel-welded attachments.

Approval Date: December 31, 1996

See Numeric Index for expiration and any reaffirmation dates.

Case N-323-1
Alternative Examination for Welded Attachments to Pressure Vessels
Section XI, Division 1

Inquiry: What alternative to the requirements of Examination Category B-K of the 1995 Addenda or Examination Category B-H from the Winter 1981 Addenda, through the 1995 Edition may be performed for welded attachments to pressure vessels as shown in Figs. 1 and 2 when only one side of the attachment weld is accessible for examination?

E *Reply:* It is the opinion of the Committee that as an alternative to the requirements of Examination Category B-K of the 1995 Addenda or Examination Category B-H from Winter 1981 Addenda to the 1995 Edition:

(a) for the configuration shown in Figs. 1 and 2, a surface examination from the accessible side of the attachment weld may be performed or;

(b) for the configuration shown in Fig. 2, a volumetric examination of Volume A-B, C-D from the accessible side of the attachment weld may be performed.

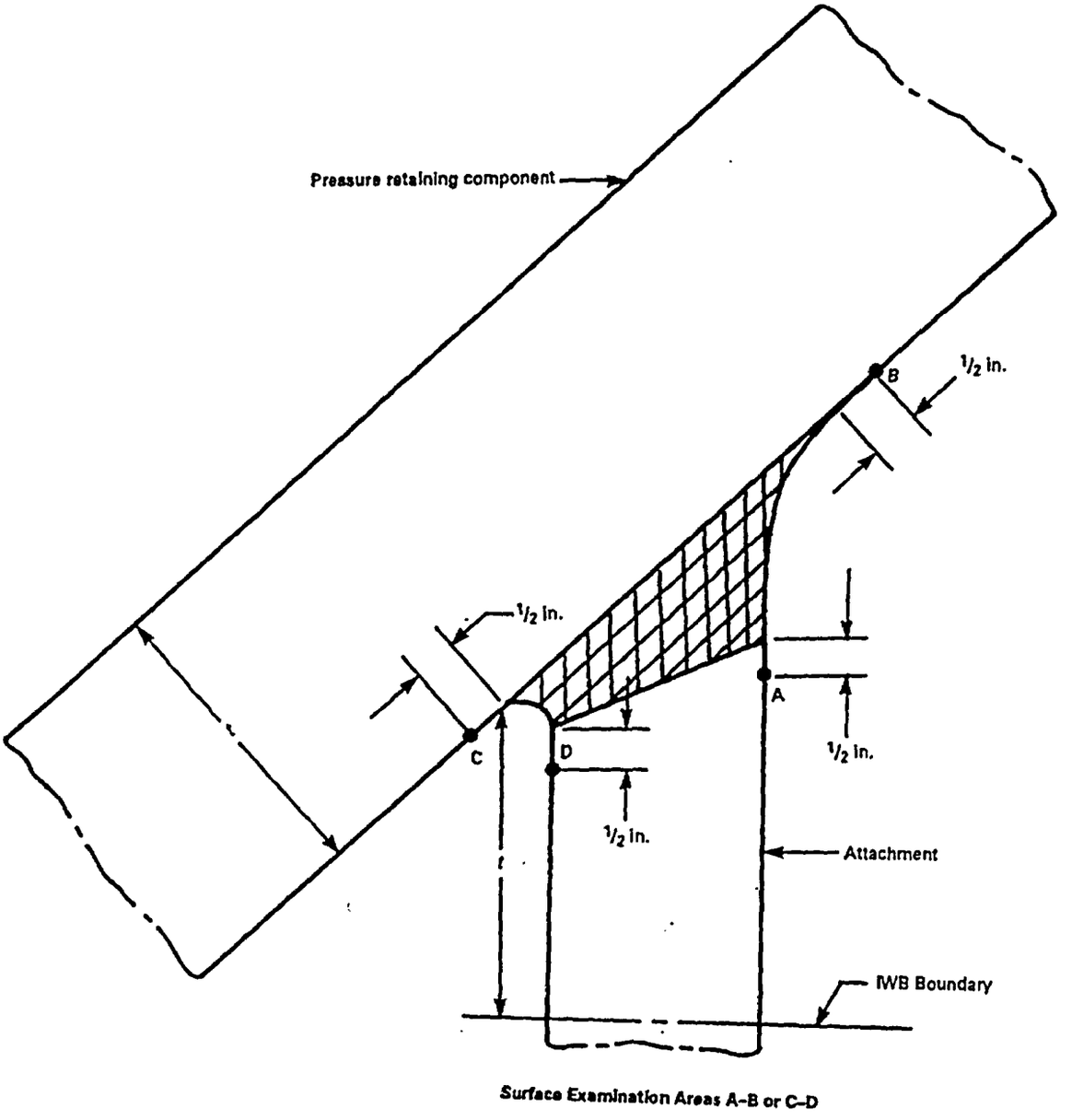
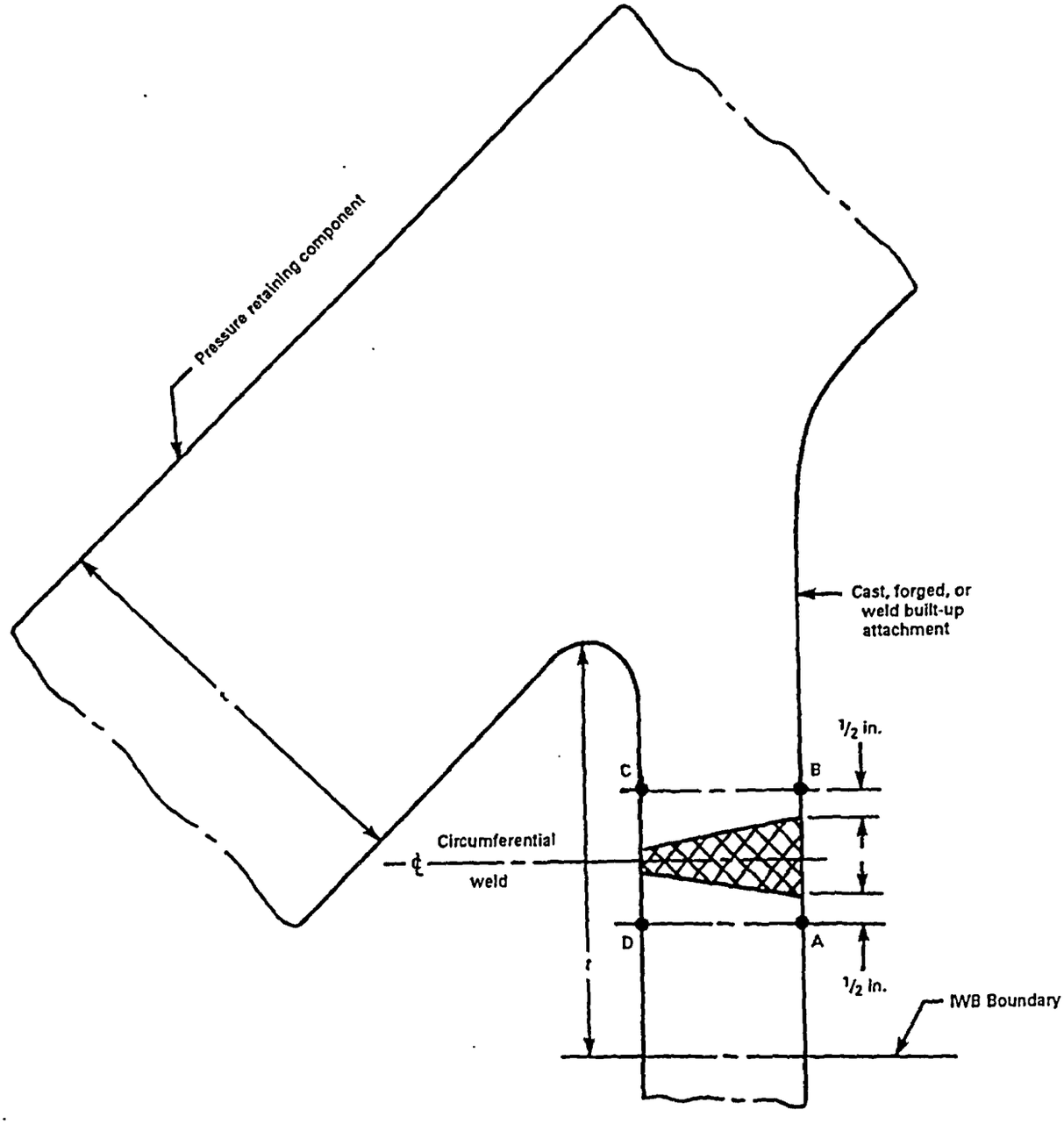


FIG. 1 WELDED ATTACHMENT



Surface Examination Areas A–B or C–D

FIG. 2 WELDED ATTACHMENT

Approval Date: September 16, 1981

See Numeric Index for expiration and any reaffirmation dates.

Case N-323
Alternative Examinations for Integrally Welded Attachments to Vessels
Section XI, Division 1

Inquiry: What alternative examinations may be performed for the integrally welded attachments to vessels as shown in Figs. 1(a), 1(b), and 1(c) in lieu of the requirements of Examination Category B-H, Table IWB 2500-1 of Section XI, Division 1, 1974 Edition?

Reply: It is the opinion of the Committee that only a surface examination from the accessible side of the support is required in lieu of the requirements of Examination Category B-H, Table IWB 2500-1 of Section XI, Division 1, 1974 Edition, provided the following conditions are met at the integrally welded attachment to vessels as shown in Figs. 1(a), 1(b), and 1(c):

(1) the stress intensities in region C-D do not exceed 80% of the Levels A, B, C, and D Service Limits (NB-3000), and

(2) the cumulative usage factor U [(NB-3222.4(e)(5)] does not exceed 0.1.

(See next page for Fig. 1.)

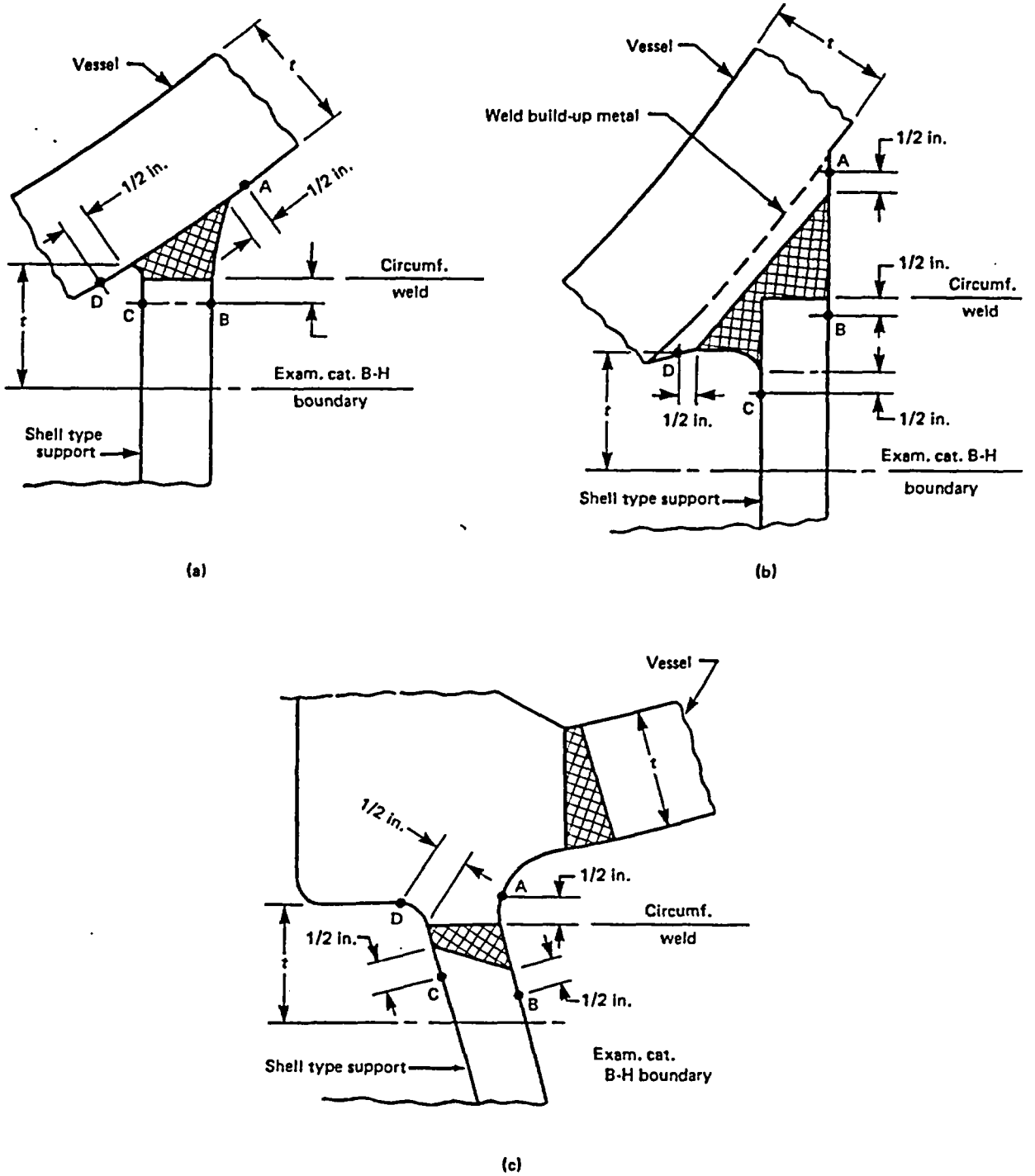


FIG. 1 INTEGRALLY WELDED ATTACHMENTS TO VESSELS

SAMPLE COMPARISON TABLE

FOR A 10-YEAR INTERVAL OF

INTEGRAL ATTACHMENT EXAMINATIONS

Components	Populations	Existing Code Required Exams	Proposed Code Case Required Exams
Class 1 & 2 Vessels	(1) Group of 4 Vessels 3 Attachments Per Vessel	3 Attachments On 1 Vessel Volumetric Or Surface as Applicable	* 1 Attachment On 1 Vessel Surface Only
* Supports Must Be Required for Examination Under Code Case N-491.			
Class 3 Vessels	(1) Group of 4 Vessels 3 Attachments Per Vessel	3 Attachments On 1 Vessel Visual, VT-3	* 3 Attachments On 1 Vessel Visual, VT-1
* Only Applies If the Owner Has Determined The Vessel Is In A System Where Attachments Are Subject To Corrosion.			
Class 1 Piping, Pumps & Valves	Existing All Attachments Where B-J Welds Are Selected ≥ 5/8" Thick	Based On 25% B-J Weld Selection No Fixed Numbers Available. If Of 200 Total Supports 66 Have Attachments. Estimate 25% Or 17 Attachments Are Required For Volumetric Or Surface Examination As Applicable Depending On Attachment Locations In Relation To B-J Weld Selections.	Based On 25% Support Selection Under Code Case N-491. If Of 200 Total Supports 100 Have Attachments. Only 50 Supports Are Required For Examination Under Code Case N-491. Estimate 1/2 Or 25 Of These Supports Have Attachments 10% or 3 Attachments Are Required For Surface Examination.
	Proposed Code Case All Attachments On Supports Selected Under Code Case N-491 No Thickness Exemptions		

SAMPLE COMPARISON TABLE (CONT'D)

FOR A 10-YEAR INTERVAL

INTEGRAL ATTACHMENT EXAMINATIONS

Components	Populations	Existing Code Required Exams	Proposed Code Case Required Exams
Class 2 Piping, Pumps & Valves	Existing All Attachments Where C-F-1, C-F-2, & C-G Welds Are Selected ≥ 3/4" Thick	Based On 7.5% C-F Weld Selection No Fixed Numbers Available. If Of 600 Total Supports 200 Have Attachments Estimate 7.5% Or 15 Attachments Are Required For Surface Examination Depending On Attachment Locations In Relation To C-F Weld Selections.	Based On 15% Support selection Under Code Case N-491. If Of 600 Total Supports 300 Have Attachments. Only 90 Supports Are Required For Examination Under Code Case N-491. Estimate 1/2 Or 45 Of These Supports Have Attachments 10% or 5 Attachments Are Required For Surface Examination.
	Proposed Code Case All Attachments On Supports Selected Under Code Case N-491 No Thickness Exemptions		
Class 3 Piping, Pumps & Valves	Existing All Attachments	If Of 300 Total Supports 100 Have Attachments All 100 Attachments Require Visual, VT-3 Examination.	If Of 300 Total Supports 100 Have Attachments And Only 50 Of These Supports With Attachments Are Located On Systems That An Owner Has Determined Are Subject To Corrosion Then 10% Or 5 Attachments Are Required For Visual, VT-1 Examination.
	Proposed Code Case All Attachments On Owner Determined Systems Where Attachments Are Subject To Corrosion.		

Inc 91-28

PROPOSED CODE CASE PRESENTATION

FOR

INTEGRALLY WELDED ATTACHMENT

EXAMINATIONS

ASME SECTION XI MEETINGS

FEBRUARY 1992

Prepared By: Raymond A. West - Northeast Utilities

BACKGROUND

- TASK GROUP ON ISI OPTIMIZATION ACTION ITEM STARTED IN AUGUST 1990

  Goal: Optimization Of Requirements / Develop The Best, Effective, Functional As Possible Requirements.

- EXPERIENCE WAS THE MAJOR BASIS USED TO DEVELOP THIS CODE CASE, BUT CONSIDERATION HAS BEEN GIVEN TO UNCERTAINTIES

  20 YEARS Of Industry Experience - Over 1000 YEARS Of Operating Experience For 111 Operating Nuclear Power Plants.

MAJOR POINTS ADDRESSED

- BASIS FOR EXISTING REQUIREMENTS

  Examination Requirements For Integrally Welded Attachments Were Developed To Be Similar To Those Required For Their Connected Pressure Boundary Components.

- POTENTIAL FOR FAILURES

  Industry Survey Results Were Obtained From 43 Plants, Licensee Event Reports Were Reviewed And Followup Telephone Conservations Were Made To Conclude That:

  RESULTS Showed OPERATIONAL TRANSIENTS/WATER HAMMERS To Be The Major Potential For INTEGRALLY WELDED ATTACHMENT FAILURES And That A Possibility Exists For CORROSION RELATED FAILURES.

- NDE METHOD RELIABILITY - SURFACE, VOLUMETRIC AND VISUAL

  Surface Examinations Were Not Needed When Failures Occurred / Welds Were Broken.

  Volumetric Examinations Were Rarely Used Except For Vessel Attachment Welds And No Failures Have Been Identified With This Method.

  Visual VT-3 Examinations Were Not Detailed Enough To Evaluate Corrosion.

- INDUSTRY EXPERIENCE FROM ISI RESULTS

  Failures Have Been Identified As A Result Of Connected Support Member Deformation And Have Not Been Identified By The Present Code Examination Requirements.

  Five Cases Of Reported Industry Failures Have Occurred Over The Past 20 Years And Only 1 case Resulted In Leakage From A Pressure Boundary Component And (THIS WAS A DESIGN FAILURE).

- SAFETY CONSEQUENCES OF FAILURES

  Even In The Rare Instances Of "Failures" Associated With Attachment Welds They Have Not Caused A Catastrophic Rupture Of Any Pressure Boundary Component.

  Leak-Before-Break Can Be Argued For Decreased Safety Significance Of These Attachments Based On The Facts That Pressure Boundary Materials Involved Are Quite Ductile And That Corrosive Environments Or High Fatigue Loading Is Not Generally Present On Component Outside Surfaces.

- ALARA IMPACTS

  Industry Estimated Radiation Exposure That Has Been Expended To Perform Existing Code Required Examinations = 951 PERSON-REM.

- COSTS

  Industry Estimated Dollars Spent To Perform Existing Code Required Examinations = 9.6 Million.

WHAT DOES THIS CODE CASE ACCOMPLISH ?

- PROVIDES CONSISTENCY - between the examination requirements for Integral Attachments identified under the IWB, IWC, and IWD 2500-1 Tables. (THESE TABLES ARE NOW IN DIFFERENT FORMATS)

- INCREASES REQUIREMENTS - for examinations of Class 1 Attachments after 20 Years of Plant Operation. (NO REQUIREMENTS NOW EXIST)

- INCREASES THE POPULATION - of Class 1 and 2 Attachments subject to Examination by eliminating their existing Attachment Thickness Exemptions. (THE EXEMPTIONS HAVE NO TECHNICAL BASIS)

- INCREASES THE FREQUENCY - of examinations by requiring all Classes of attachments to be examined whenever component support member deformation (e.g., Broken, Bent, or Pulled Out Parts) is identified. (SUPPORT DAMAGE HAS BEEN EVIDENT WITH ATTACHMENT WELD FAILURES)

- INCREASES THE METHOD - of examination for Class 3 Integral Attachments from a Visual VT-3 to a Visual VT-1 examination. (A VISUAL VT-3 EXAMINATION IS NOT DETAILED ENOUGH EVALUATE CORROSION)

- DECREASES THE SAMPLES - of Class 1 and 2 Integral Attachment Examinations significantly even with the increases of the Attachment population described above. Bases the selection of these Attachment samples on the supports selected for examination under the New IWF Sampling Plan (Code Case N-491). (THESE SAMPLES ARE REQUIRED PURELY TO APPLY A CONSERVATISM TO ANY QUESTIONS OF UNCERTAINTIES RESULTING FROM DATA THAT HAS BEEN COMPILED TO DEVELOP THIS CODE CASE)

- DECREASES AND LIMITS THE SAMPLES - of Class 3 Integral Attachment Examinations to Owner determined systems (such as Service Water or Emergency Service Water) where the Integral Attachments are subject to corrosion. (SUPPORTING DATA HAS SHOWN NO CLASS 3 INTEGRAL ATTACHMENT FAILURES)

CONCLUSION

- I believe this Code Case provides the Optimization (THE BEST, EFFECTIVE, FUNCTIONAL AS POSSIBLE) of Requirements that is needed to reduce costs and radiation exposure associated with these examinations.

- It focuses our resources directly in the areas of known and potential problems.

- It provides a realistic approach to Inservice Inspection while not compromising quality and I RESPECTFULLY RECOMMEND APPROVAL.