Date Distributed: December 15, 2009

THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS

SUBGROUP ON HISTORICAL BOILERS

AGENDA

Meeting of January 18, 2010
Austin, Texas

The National Board of Boiler & Pressure Vessel Inspectors
1055 Crupper Avenue
Columbus, Ohio 43229-1183
Phone: (614)888-8320
FAX: (614)847-1828

1. **Call to Order – 1:00 p.m.**

2. **Announcements**

3. **Adoption of the Agenda**

4. **Approval of Minutes**

5. **Review of the Roster (Attachment 1)**

6. **Action Items (Attachment 2)**

NB09-1201 Review Part 2 Supplement 2 to see what needs to be added and expanded upon. (No Attachment)

July 2009
A progress report was given.

January 2010
Mr. Reetz is expected to report.

NB09-1202 Review Part 3 Supplement 2 to see what needs to be added and expanded upon. (No Attachment)

July 2009
A progress report was given.

January 2010
Mr. Reetz is expected to report.

NB10-0103 ***Part 3 Part 3 S2.13.9.2 SG on Historical*** Resolve conflict of text and figure S2.13.9.2. (Attachment 2, pg. 1)

January 2010
Mr. Reetz is expected to report.

NB10-0104 ***Part 3 S2.13.12.2 SG on Historical*** Should the reference in a) be to S2.13.11.2 or what is written. (Attachment 2, pgs.2-4)

January 2010
Mr. Reetz is expected to report.

NB10-0105 ***Part 3 S2.13.12.2 SG on Historical*** Remove a) from paragraph and revise wording so both paragraphs are clear. Clarify rules for Welded Flush Patches in Tubesheets. (Attachment 2, pgs. 5-6)

January 2010
Mr. Reetz is expected to report.

7. **New Business**

8. **Future Meetings**

July 2010, Columbus, Ohio
January 2011, Austin, Texas

9. Adjournment

Respectfully Submitted,

Bill Smith
Secretary

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NBIC Subgroup on Historical Boilers

Member	Title	Expiration Date
Wahl, Mike		04/30/2012
Johnson, Frank		04/30/2012
Cook, Don		04/30/2012
Babcock, Bruce E.		04/30/2012
Rupert, Dennis		04/30/2012
Larson, James P.		04/30/2012
Bacon, Steven E.		04/30/2012
Dillon, Tom	Vice Chair	08/27/2012
Reetz, Robert	Chair	08/27/2012
Total Members:	8	

NB 10-0103 **Attachment 2**

A07 S2.13.9.2 WELDED REPAIR OF CRACKS IN UNSTAYED AREAS

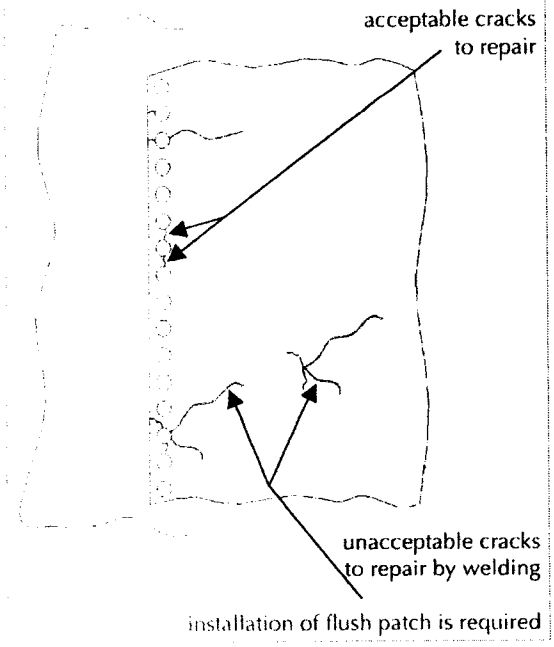
A07 a) Prior to repairing cracks, the plate shall be NDE examined for other defects. All affected sections shall be repaired. (See Figure S2.13.9.2).

A07 b) Cracks in stayed areas may be repaired by welding. Before cracks are repaired, however, the inner surface of the plate should be examined for possible excessive corrosion or grooving.

A07 c) Cracks in unstayed areas may be repaired by welding, providing the cracks do not extend between rivet holes in a longitudinal seam or parallel to a longitudinal seam within 8 in. (200 mm). The completed repair must be radiographed and stress relieved. Alternative methods in lieu of Postweld Heat Treatment identified in 2.5.3 may be used.

A07 d) Cracks radiating from a common point (star cracking) shall not be repaired; installation of a flush patch is required. Cracks radiating from a rivet hole in a girth seam may be repaired if the plate is not seriously damaged.

A07 FIGURE S2.13.9.2
Unstayed Area Crack Repair



e) Prior to welding, the rivets into which cracks extend and the rivets on each side of them shall be removed. A07

f) In riveted joints, tack bolts should be placed in alternating holes to hold the plate laps firmly. A07

g) Rivets holes should be reamed after welding. A07

h) Welding shall not cover rivet heads. A07

S2.13.9.3 WELDED FLUSH PATCHES IN UNSTAYED AREAS A07

a) Welded repairs to boiler unstayed areas shall be radiographically examined in accordance with the approved code of construction or ASME Code, Section I, when the size of the repaired area is greater than 3 in. (75 mm) in diameter. The completed repair must be stress relieved. Alternative Methods without Postweld Heat Treatment identified in 2.5.3 may be used. A07

b) The weld around a flush patch shall be a full penetration weld and the accessible surfaces shall be ground flush. Examples of flush welded patches are shown in Figure S2.13.9.3. A07

c) Before installing a flush patch, the defective material should be removed until sound material is reached. A07

d) The patch should be rolled or pressed to the proper shape or curvature. The edges of the patch should align with original material without overlap. Patches shall fit flush on the waterside of the sheet. If the patch includes an existing riveted seam, A07

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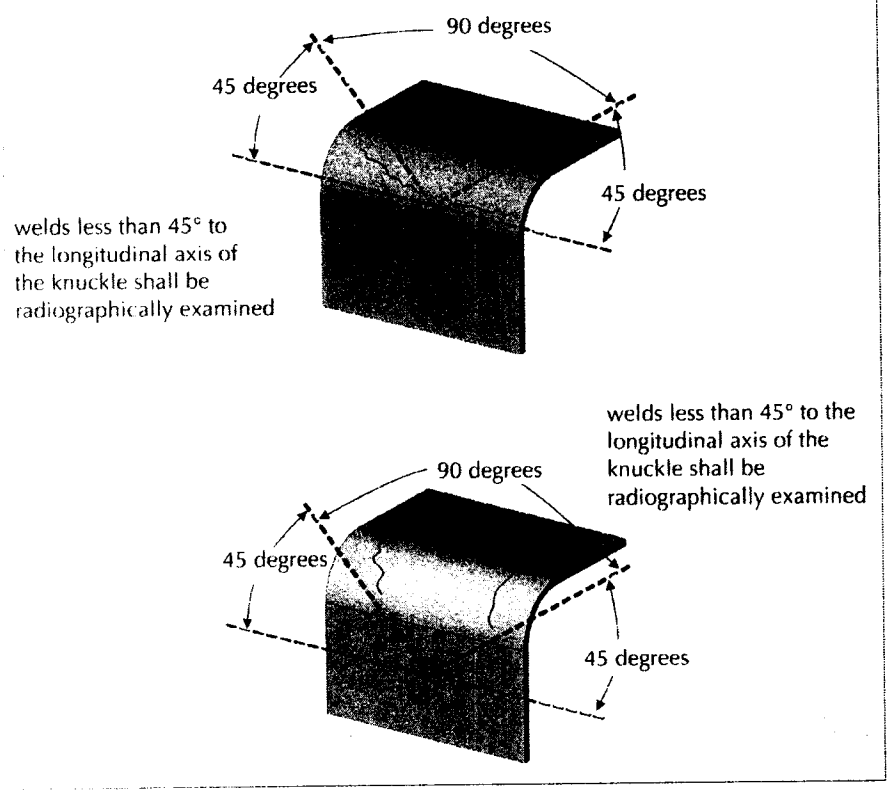
A07 **FIGURE S2.13.11.2**
Knuckle Weld Angles



A07 S2.13.11.3 WELDED FLUSH PATCHES IN FIREBOX AND TUBESHEET KNUCKLES

A07 Any patch not supported by means other than the weld, such as rivets, staybolts, tubes, or other forms of construction, shall have all weld seams radiographically examined. (See Figure S2.13.11.3). All other requirements specified in S2.13.9.3 shall be followed.

A07 S2.13.12 REPAIR OF TUBESHEETS

A07 S2.13.12.1 WELD BUILDUP OF WASTAGE AND GROOVING IN TUBESHEETS

All requirements of S2.13.9.1 and S2.13.10 shall be followed with the additional requirements listed below:

a) Damaged tubesheet holes may be repaired by welding. A07

b) Prior to welding, tubes in the wasted area should be removed.

c) Tube holes should be reamed after welding.

d) Welding shall not cover tube ends.

S2.13.12.2 WELDED REPAIR OF CRACKS IN TUBESHEETS A07

a) The same method of repairing cracks in stayed areas identified in Figure S2.13.12.2 shall be followed with the additional requirements identified below:

1) Cracks in a tubesheet and cracks between tubesheet ligaments may be

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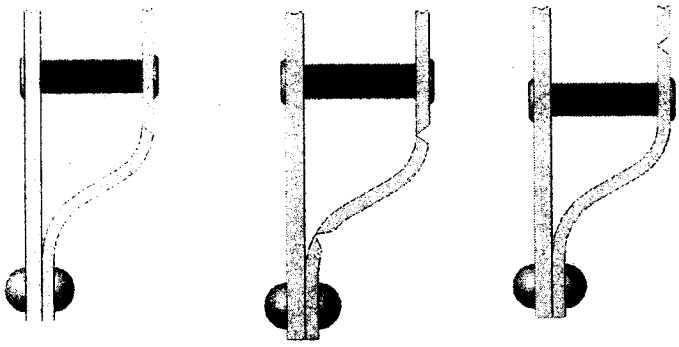
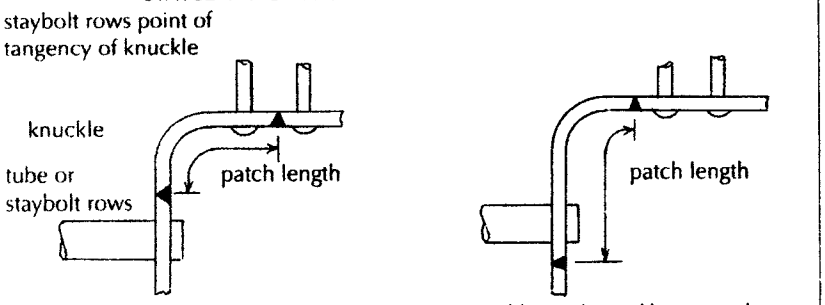
A07 FIGURE S2.13.11.3
Knuckle Flush Patch



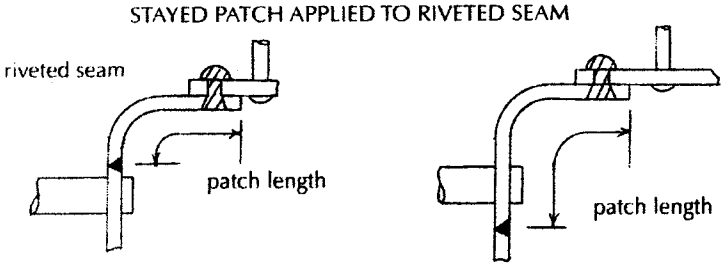
STAYED PATCH APPLIED TO BUTT WELDED SEAM



weld seams located between staybolt rows and above first tube row or staybolt row

weld seam located between tube rows below staybolt rows or tube rows

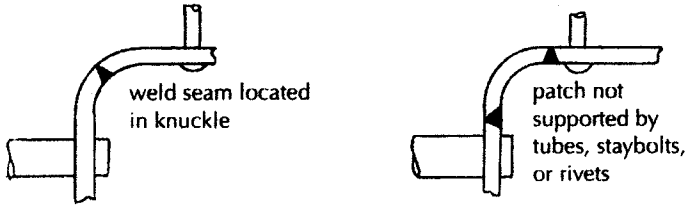
STAYED PATCH APPLIED TO RIVETED SEAM



weld seam located above first tube row or staybolt row

weld seam located between tube rows or staybolt rows

REPAIRS REQUIRING RADIOGRAPHIC EXAMINATION OF WELD SEAMS



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repaired by welding using full penetration welds. Before cracks are repaired, however, the inner surface of the plate should be carefully examined for possible excessive corrosion or grooving.

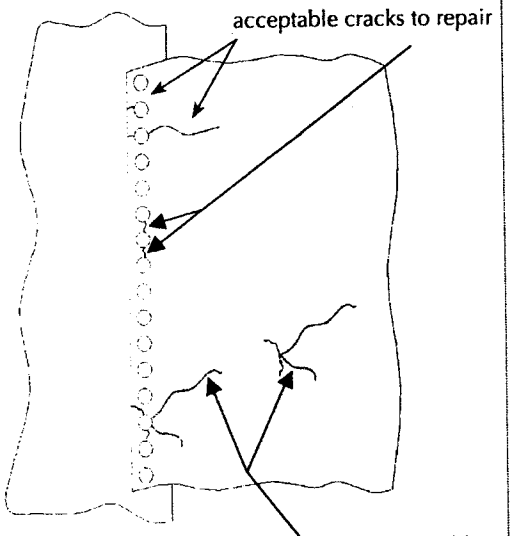
2) If the crack extends into a tube hole, the tube shall be removed prior to making the repair.

3) Tube holes should be reamed after welding.

4) Welding shall not cover tube ends.

A07

FIGURE S2.13.12.2
Stayed Area Crack Repair

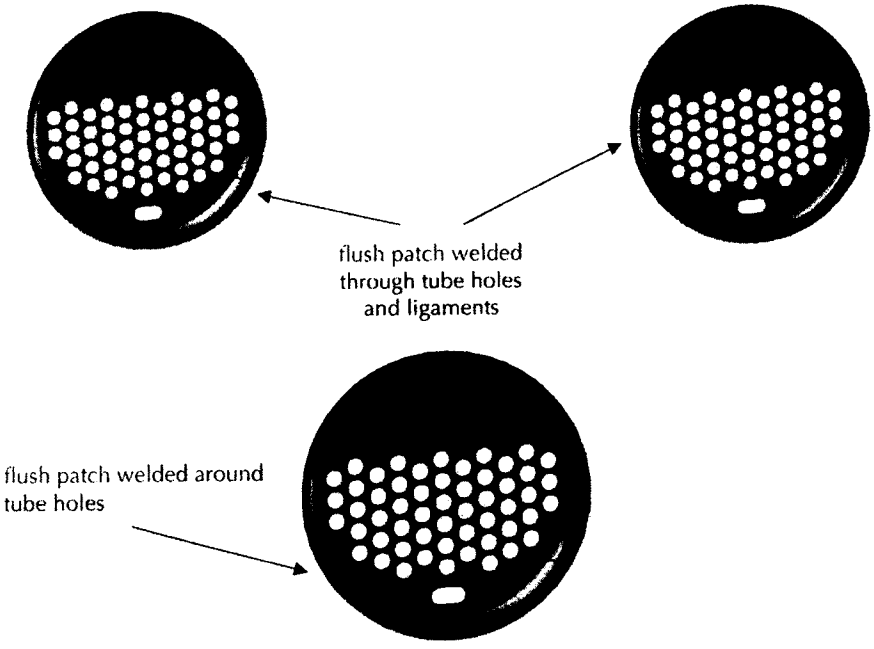


A07 S2.13.12.3 WELDED FLUSH PATCHES IN TUBESHEETS

a) The method of repair shall follow the same requirements identified in S2.13.10.3 with the following requirement as noted below:

1) Tubes, staybolts, and rivets should be installed after welding of the patch is completed. (See Figure S2.13.12.3).

A07 **FIGURE S2.13.12.3**
Tubesheet Flush Patch



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repaired by welding using full penetration welds. Before cracks are repaired, however, the inner surface of the plate should be carefully examined for possible excessive corrosion or grooving.

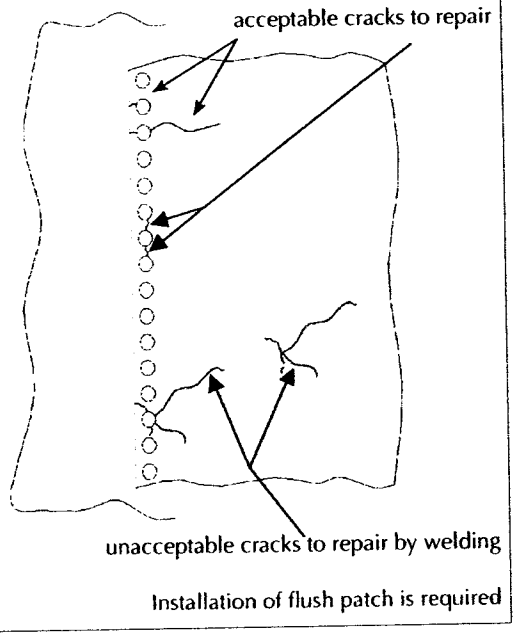
2) If the crack extends into a tube hole, the tube shall be removed prior to making the repair.

3) Tube holes should be reamed after welding.

4) Welding shall not cover tube ends.

A07

FIGURE S2.13.12.2
Stayed Area Crack Repair



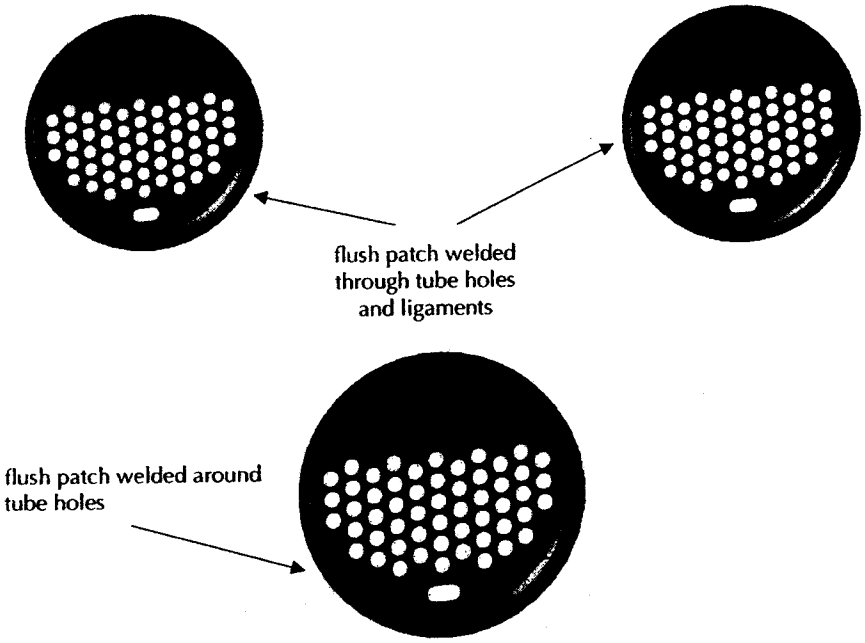
A07 S2.13.12.3 WELDED FLUSH PATCHES IN TUBESHEETS

a) The method of repair shall follow the same requirements identified in S2.13.10.3 with the following requirement as noted below:

1) Tubes, staybolts, and rivets should be installed after welding of the patch is completed. (See Figure S2.13.12.3).

A07

FIGURE S2.13.12.3
Tubesheet Flush Patch



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A07 S2.13.13 SEAMS, JOINTS, AND RIVETS

A07 S2.13.13.1 CAULKING RIVETED SEAMS AND RIVET HEADS SEE FIGURE S2.13.13.1

a) Caulking refers to the sealing of plate seams and rivet heads by driving the edge of one surface onto the other by use of an impact tool.

b) The plate edges should be beveled to an angle not sharper than 70 degrees to the plane of the plate and as near thereto as practicable.

c) Caulking shall be done with a tool of such form that there is no danger of scoring or damaging the plate underneath the caulking edge, or splitting the caulked sheet.

d) Riveted seams and rivet heads may be recaulked after repairs to tighten joint.

A07 S2.13.13.2 RIVET HOLES

a) All holes for rivets in plates, buttstraps, heads, stays, and lugs shall be drilled; or they may be punched at least 1/8 in. less than full diameter for material not over 5/16 in. in thickness and at least 1/4 in. less than full diameter for material over 5/16 in.

b) Such holes shall not be punched in material more than 5/8 in. in thickness.

c) For final drilling or reaming the hole to full diameter, the parts shall be firmly bolted in position by tack bolts.

d) The finished holes must be true, clean, and concentric.

S2.13.13.3 ASSEMBLY OF RIVETED JOINTS A07

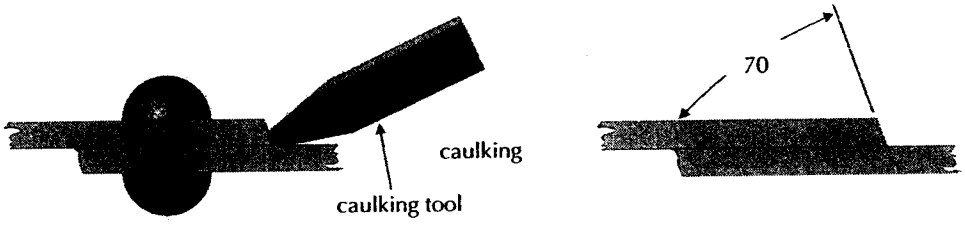
After drilling or reaming rivet holes, the plates shall be separated, the burrs and chips removed, and the plates reassembled. Barrel pins fitting the holes and tack bolts to hold the plates firmly together shall be used.

S2.13.13.4 RIVETING A07

a) Rivets shall be so driven as to fill the holes preferably by a machine that maintains the pressure until no part of the head shows red in the daylight. Barrel pins fitting the holes and tack bolts to hold the plates firmly together shall be used. A rivet shall be driven on each side of each tack bolt before removing the tack bolt.

b) Rivets shall be of sufficient length to completely fill the rivet holes and form heads at least equal in strength to the bodies of

A07 **FIGURE S2.13.13.1**
Rivet Heads



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