



*THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS*

NATIONAL BOARD INSPECTION CODE SUBGROUP REPAIRS & ALTERATIONS

MINUTES

Meeting of July 12, 2022
Indianapolis, IN

These minutes are subject to approval and are for the committee use only. They are not to be duplicated or quoted for other than committee use.

The National Board of Boiler & Pressure
Vessel Inspectors 1055 Crupper Avenue
Columbus, Ohio 43229-
1183
Phone: (614)888-8320
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1. Call to Order

Chair Boseo called the meeting to order at 8:00am Eastern Time in the Alexander Ballroom on the second floor of the hotel.

2. Roll call of Members and Introduction of Visitors

Secretary Hellman called roll of the Members and held introductions of visitors

3. Check for a Quorum

Secretary Hellman verified a quorum was reached. ([Attachment 1](#))

4. Announcements

- The National Board will be hosting a reception on Wednesday evening from 6:30pm to 8:30pm in City Way Gallery.

- The National Board will be hosting breakfast and lunch on Thursday. Breakfast will be served from 7:00am to 8:00am, and lunch will be served from 11:30am to 12:30pm. Both meals will be served at the hotel in Market Table.

- This meeting is the last at which items can be approved for inclusion in the 2023 NBIC edition.

5. Adoption of the Agenda

a. The following revisions were made to the Agenda:

- i. Added I20-78
- ii. Added I21-39
- iii. Revised A20-83
- iv. Revised A21-12
- v. Updated A21-45
- vi. Revised A22-04
- vii. Revised A22-05
- viii. Added A22-18
- ix. Added A22-19,
- x. Added A22-21

b. The agenda was unanimously accepted, as revised.

6. Approval of the Minutes of the January 18, 2022 Meeting

The minutes are available for review on the National Board website, www.nationalboard.org. The Minutes were motioned, seconded, and unanimously approved.

7. Review of Rosters

a. Membership Nominations

- i. There were no new membership nominations

b. Membership Reappointments

- i. The following Subgroup R&A memberships are set to expire prior to the January 2023 NBIC meetings: Mr. Tim McBee and Mr. Bob Underwood.
- ii. Both, Mr. McBee and Mr. Underwood were Unanimously Approved (UA) to be reappointed by the SG Membership.

c. Officer Nominations

- i. There were no Officer Nominations.

- d. Presentation by Aaron Viet aaronv@cgthermal.com on Graphite equipment.

8. Interpretation Items

NOTE: Action Item A22-21 was taken first to support I20-78

Item Number: I20-78	NBIC Location: Part 3, 3.3.3 s) & 3.4.4 d)	Attachment 2
General Description: Repairs and Alterations of Tube Bundles		
Subgroup: Repairs and Alterations		
Task Group: Paul Shanks		
Explanation of Need: Submission is for R Certificate Holders we provide Repair Inspection services for. NBIC Part 3, 3.3.3 s) seems to allow to be a repair, but under 3.4.4 d) where the dimensions change it might be classified as an alteration.)		
July INT TG Action: P. Shanks presented that this is still being held back. Progress Report till 21-12 is resolved.		
July Meeting Action: P. Shanks presented that this is still being held back. Progress Report till 21-12 is resolved.		
January INT TG 2022 Meeting Action: P. Shanks presented that this is still being held back. Progress Report till 21-12 is resolved.		
July INT TG 2022 Meeting Action: A new Action Item will be submitted to address this item. This will be an Intent Interp once the new Action Item is approved. This is a PR.		
July SG R&A 2022 Meeting Action: Paul Shanks presented. The proposal was revised to match the related A22-21 and was UA.		

Item Number: I21-39	NBIC Location: Part 3, 3.3.2 e)	Attachment 3
<p>General Description: Routine repair scope</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: P. Shanks (PM), P. Gilston</p> <p>Explanation of Need: Some R-certificate holders and AIAs are making huge (100 square feet) weld metal buildup type routine repairs on the basis that the components being built up are only 5" tubes and 3.3.2 e) 1) says welded repairs to 5" tubes are routine. As 3.3.2 e) includes "shall be limited to" shouldn't exceeding any one of the listed limitations preclude the routine repair approach.</p> <p>INT TG January 2022 Meeting Action: P. Shanks presented and issues with weld buildup vs corrosion resistance weld overlay and what is a routine repair to pipe < 5" per 3.3.2 e). The proposal was revised, and a Committee's question and answer were drafted. The proposal was Approved. M. Toth abstained.</p> <p>July INT TG 2022 Meeting Action: B. Boseo requested to address this item at SG R&A. This was a PR.</p> <p>July SG R&A 2022 Meeting Action: P. Shanks presented a revised proposal. The proposal was UA.</p>		

9. Action Items

Item Number: A20-48	NBIC Location: Part 3, 1.6	Attachment 4
<p>General Description: Review NR Program (1.6) to 2015 NQA-1 Edition</p> <p>Subgroup: NR TG</p> <p>Task Group: R. Spuhl (PM)</p> <p>Explanation of Need: Latest NQA-1 revision to be compared to NR program (1.6) for consistency.</p> <p>SG R&A January 2022 Meeting Action: R. Spuhl presented a Progress Report regarding NQA-1 and Sect. III.</p> <p>July SG R&A 2022 Meeting Action: R. Spuhl presented. Proposal was UA.</p>		

Item Number: A20-52	NBIC Location: Part 3, 1.6.2 a) 2)	Attachment 5
<p>General Description: Rvw NR requirements for ASME Section XI Div. 2 potential applications</p> <p>Subgroup: NR TG</p> <p>Task Group: T. Roberts (PM),</p> <p>Explanation of Need: This was created based on discussion from Item 20-47 dealing with ANIA requirements.</p> <p>SG R&A January 2022 Meeting Action: R. Spuhl presented a Progress Report</p> <p>July SG R&A 2022 Meeting Action: R. Spuhl presented a proposal to add “Division 1” after every reference to “ASME Section XI”. The proposal was UA</p>		

Item Number: A20-67	NBIC Location: Part 3, S6	Attachment 6
<p>General Description: Revisions to Part 3, Supplement 6</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: R. Underwood (PM), T. McBee, G. Galanes</p> <p>Explanation of Need: Supplement 6 was implemented into the 2007 Edition of the NBIC Part 3 to provide requirements and guidelines for repairs, alterations and modifications to DOT Transport Tanks using the National Board's "TR" Program (which was never implemented). S6 has been revised over the years to remove reference to the "TR" Program, but still contains many requirements that are not correct. This purpose of this proposal is to review the entire Supplement and make appropriate revisions that comply with NBIC Part 3 and DOT requirements.</p> <p>SG R&A January 2022 Meeting Action: Mr. Underwood presented a Progress Report.</p> <p>July SG R&A 2022 Meeting Action: B. Underwood presented. The proposal was UA with an email sent to the R&A SC to review before tomorrow’s SC Meeting.</p>		

Item Number: A20-83	NBIC Location: Part 3, 1.5.1 s) & 9.1	No Attachment
<p>General Description: Definition of Nonconformance</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: B. Boseo (PM)</p> <p>Explanation of Need: Action Item 19-60 is proposing revisions/additions to all of 1.5.1. This proposal is to move the definition of "Nonconformance" out of the current 1.5.1 s) paragraph and into the glossary.</p> <p>SG R&A January 2022 Meeting Action: B. Boseo presented and will have a meeting with Part 4. This was a PR.</p> <p>July SG R&A 2022 Meeting Action: B. Boseo presented. Since Part 4 will not approve, this item was Closed w/No Action.</p>		

Item Number: A21-02	NBIC Location: Part 3, 1.6	Attachment 7
<p>General Description: Define "Fuel Loading" as it pertains to NR activities</p> <p>Subgroup: NR TG</p> <p>Task Group: P. Edwards (PM), R. Spuhl appointed as PM in Dec. 2021.</p> <p>Explanation of Need: The NR TG would like to clarify "Fuel Loading" as used to determine Category 1, 2 or 3 NR activities.</p> <p>SG R&A January 2022 Meeting Action: R. Spuhl presented a PR.</p> <p>July SG R&A 2022 Meeting Action: R. Spuhl presented. The proposal was UA</p>		

Item Number: A21-06	NBIC Location: Part 3, 4.4.2	No Attachment
General Description: Concessions with pressure testing associated with replacement parts		
Subgroup: Repairs and Alterations		
Task Group: M. Quisenberry (PM), R. Miletti, P. Becker, P. Davis, R. Underwood, M. Winters		
Explanation of Need: When replacement parts are manufactured and not tested as required by the original code of construction, there needs to be concessions or considerations associated with the pressure testing requirements as to not detrimentally effect the existing pressure retaining item.		
SG R&A January 2022 Meeting Action: M. Quisenberry presented a PR		
July SG R&A 2022 Meeting Action: M. Quisenberry presented. 3.2.2 e) addresses this question. Closed w/No Action.		

Item Number: A21-12	NBIC Location: Part 3, 3.3.3, 3.4.4, Section 9	Attachment 8
General Description: Clarify the definitions and examples of “Repair” and “Alteration”		
Subgroup: Repairs and Alterations		
Task Group: K. Moore, R. Underwood, M. Chestnut, T. Seime		
Explanation of Need: Clarify the definitions of “Repair” and “Alteration” in the Glossary and revise the list of examples of each to better define the allowable scope of activities.		
SG R&A January 2022 Meeting Action: P. Becker was not able to present. This was a PR		
July SG R&A 2022 Meeting Action: P. Becker presented a revised proposal. A Rvw & Comment LB will go to SG R&A.		

Item Number: A21-31	NBIC Location: NBIC Glossary	No Attachment
<p>General Description: Revise definition of "Field"</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: R. Miletti (PM), P. Gilston, M. Toth, J. Walker</p> <p>Explanation of Need: A "Field" site under the current definition could be multiple rented or leased spaces used for repairs/alterations, where there is no single or specific customer or job, but rather the locations(s) are used for conducting repair/alteration activities by personnel employed by the Certificate Holder on a continual basis.</p> <p>SG R&A January 2022 Meeting Action: R. Miletti presented definitions (from ASME) of Temporary Location and Field Site. This was a PR.</p> <p>July SG R&A 2022 Meeting Action: P. Gilston presented a PR</p>		

Item Number: A21-37	NBIC Location: Part 3, 1.6	No Attachment
<p>General Description: Parts used in NR Activities</p> <p>Subgroup: NR TG</p> <p>Task Group: B. Wielgoszinski (PM), R. Spuhl assigned as PM in Dec. 2021.</p> <p>Explanation of Need: Clarification that parts used in NR activities are fabricated by NR Certificate Holders and inspected by appropriately endorsed National Board commissioned Inspectors.</p> <p>SG R&A January 2022 Meeting Action: B. Wielgoszinski presented a PR</p> <p>July SG R&A 2022 Meeting Action: R. Spuhl presented a PR</p>		

<p>Item Number: A21-43 NBIC Location: Part 3, Glossary Attachment 9</p> <p>General Description: Defining and revising "Practicable" and "Practical" within the NBIC</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: M. Toth (PM), B. Underwood, B. Wielgoszinski</p> <p>Explanation of Need: Defining and revising Practicable and Practical within the NBIC and revising where applicable</p> <p>SG R&A January 2022 Meeting Action: M. Toth presented a PR. B. Underwood and B. Wielgoszinski volunteered for the TG.</p> <p>July SG R&A 2022 Meeting Action: M. Toth presented that a new item may need to be opened to find these words in the other Parts of the NBIC to verify consistency. This proposal will be sent to a LB to all SG (Parts 1, 2, 3, and 4) for a vote.</p>

<p>Item Number: A21-44 NBIC Location: Part 3, Glossary Attachment 10</p> <p>General Description: Defining "De-Rating" within Part 3</p> <p>Subgroup: Repairs and Alterations</p> <p>Task Group: M. Toth (PM), B. Underwood, B. Wielgoszinski</p> <p>Explanation of Need: Defining de-rating within Part 3</p> <p>SG R&A January 2022 Meeting Action: M. Toth presented a PR. B. Underwood and B. Wielgoszinski volunteered for the TG.</p> <p>July SG R&A 2022 Meeting Action: M. Toth presented. A Rvw & Comment LB will go to all SG (Parts 1, 2, 3, and 4).</p>
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Item Number: A21-45	NBIC Location: Part 3, Supplements	Attachment 11
General Description: Add a supplement to address oil, gas and chemical repair & alteration scope		
Subgroup: Repairs and Alterations		
Task Group: R. Underwood (PM)		
Explanation of Need: There has been interest from companies operating with the Oil, Gas and Chemical industries to address certain types of repairs that may exist in ASME PCC-2 or API. NBIC does not have many of these repair methods within the book.		
January 2022 Meeting Action: R. Underwood presented a proposal with a motion to LB to SG and SC for a Vote was motioned, seconded, and UA.		
Update: This item is currently being Rvw and Comment letter balloted to Main Committee. Voice vote required at SG and SC levels to be voted on at MC.		
July SG R&A 2022 Meeting Action: B. Underwood presented. Discussion held regarding lap patches being considered as “repairs” instead of “alterations”. Per Gary Scribner, BOT may change NB-415 or may create a new document that would give direction as to where this proposal will go (i.e. new type of “R” Stamp, new ‘Division’ created within the “R” Cert. program, etc.) This was a PR.		

Item Number: A21-53	NBIC Location: Part 3, S8.5 a)	Attachment 12
General Description: Post Repair Inspection of weld repairs to CSEF steels		
Subgroup: Repairs and Alterations		
Task Group: P. Gilston (PM), E. Cutlip		
Explanation of Need: The requirement for Inspector involvement in post-repair inspections to CSEF weld repairs is to ensure future safe operation of the boiler. This is a function of the inservice Authorized Inspection Agency, not the Repair Inspector, whose duties end with completion of repair documentation.		
SG R&A January 2022 Meeting Action: P. Gilston presented. A motion to LB to Part 3 and Part 2 SGs was UA.		
Update: SG R&A approved the proposal with 1 disapproval and 2 abstentions. The SG Inspection ballot did not pass, receiving 4 approval votes, 6 disapproval votes, and 2 abstentions.		
July SG R&A 2022 Meeting Action: P. Gilston presented a PR.		

Item Number: A21-67	NBIC Location: Part 3, 3.4.9	Attachment 13
General Description: Add welding requirements to plugging firetubes		
Subgroup: Repairs and Alterations		
Task Group: P. Gilston (PM), K. Moore, M. Quisenberry, T. Sieme		
Explanation of Need: The current NBIC does not have enough direction or requirements for welding tube plugs in firetubes.		
SG R&A January 2022 Meeting Action: P. Gilston presented. Discussion took place on if omitting mechanical plugging of firetubes and changing 3.3.4.9 to be specific to plugging by welding would be received as “mechanical repairs” would not be allowed by the NBIC (as opposed to just not addressed). Trevor Sieme and M. Quisenberry volunteered to join the Task Group. The proposal was taken back for work. This was a PR.		
July SG R&A 2022 Meeting Action: P. Gilston presented a PR.		

Item Number: A21-70	NBIC Location: Part 3, Table 2.3	Attachment 14
General Description: Updating Table 2.3 in Part 3 with newest SWPSs		
Subgroup: Repairs and Alterations		
Task Group: J. Sekely (PM)		
Explanation of Need: 13 SWPSs have been updated and approved by AWS, and the list of SWPSs in Table 2.3 will need to be updated to reflect these changes.		
SG R&A January 2022 Meeting Action: Mr. Sekely was unable to present – The item will be LB		
Update: This item is currently being balloted to SC R&A.		
July SG R&A 2022 Meeting Action: Passed SC LB. To be on MC Agenda.		

Item Number: A21-80	NBIC Location: Part 3, 3.3.3(h)(2)	No Attachment
General Description: Mechanical Replacement of Shell or Head		
Subgroup: Repairs and Alterations		
Task Group: R. Underwood (PM)		
Explanation of Need: This Code revision and corresponding interpretation (I21-79) would provide clarity to NBIC users and address whether mechanical replacement of these components is considered a repair.		
SG R&A January 2022 Meeting Action: R. Underwood presented a proposal. The proposal was UA.		
Update: During the January 2022 Main Committee meeting, the Committee asked SG and SC R&A to further review this item.		
July SG R&A 2022 Meeting Action: B. Underwood presented. Motion to Close w/No Action was UA.		

Item Number: A21-82	NBIC Location: Part 3, 3.3.3(s)	No Attachment
General Description: Examples of Repairs		
Subgroup: Repairs and Alterations		
Task Group: P. Davis (PM), R. Underwood, P. Gilston, , J. Ferreira, J. Walker, E. Cutlip, . P. Miller, L. Dutra		
Explanation of Need: Adding "repair" to 3.3.3(s) would then address use of different weld material. Currently 3.3.3(s) only addresses replacement of the part, not repair (Repair is addressed in 3.3.3(r)).		
SG R&A January 2022 Meeting Action: R. Underwood presented a PR. P. Gilston, P. Davis, J. Ferreira, J. Walker, E. Cutlip, volunteered for the TG		
July SG R&A 2022 Meeting Action: B. Underwood presented a PR. The PM was changed to P. Davis. P. Miller and L. Dutra were added to the taskgroup.		

New Items:

Item Number: A22-02 NBIC Location: Part 3, 3.3.2 e) 1) No Attachment
General Description: Part 4 Item A21-83 may impact part 3, 3.3.2 e) 1)
Subgroup: Repairs and Alterations
Task Group: M. Toth (PM), B. Derby, L. Dutra, M. Carlson
Explanation of Need: Part 4 Item A21-83 was reviewed as it may impact part 3, 3.3.2 e) 1) examples of Routine Repairs. An Item for Part 3 will be opened to address “valve” repairs as they relate to SRVs.
July 2022 Meeting Action: M. Toth presented. The group verified 3.3.2 e) 1) verbiage. M. Toth to work with Part 4 to verify no impact to Part 3. This was a PR.

Item Number: A22-04 NBIC Location: Part 3, 3.3.3 s) Attachment 15
General Description: Clarification on Part 3, 3.3.3 Examples of Repairs s)
Subgroup: Repairs and Alterations
Task Group: T. White (PM)
Explanation of Need: The paragraph was written for pressure-retaining parts not just vessels as stated later in the first sentence.
July 2022 Meeting Action: T. White presented. The proposal was UA as revised.

Item Number: A22-05 NBIC Location: Part 3, 4.2(a) & 1.2 (a & b) Attachment 16
General Description: Clarify NDE requirements as it pertains to OCC edition.
Subgroup: Repairs and Alterations
Task Group: Don Kinney (PM), B. Derby, P. Davis
Explanation of Need: This Action Item is requested to clarify NDE requirements as it relates to the edition used for the original code of construction.
July 2022 Meeting Action: D. Kinney presented. Part 2 Item 21-41 was reviewed, as it was related. This Item had 2 revisions, for paragraph 1.2 and 4.2. The proposal regarding 1.2 was revised. Both proposals were UA as revised.

Item Number: A22-11	NBIC Location: Part 3, S5	Attachment 17
General Description: Changes to Yankee Dryer P3_S5		
Subgroup: Repairs and Alterations		
Task Group: Jerry Jessick (PM)		
Explanation of Need: Various updates including to recognize steel in addition to cast iron, and to promote consistency of Supplements of each Part.		
July 2022 Meeting Action: Presentation by Mr. Jessick. (A22-10 from Part 2 SG Installation). The proposal was revised based on comments. The proposal was UA and emailed to SC and MC for review so a voice vote may be possible for inclusion into the 2023 Edition of the NBIC.		

Item Number: A22-12	NBIC Location: Part 3, 3.3.5.2 & 3.4.5.1	Attachment 18
General Description: Lost or Destroyed UDS		
Subgroup: Repairs and Alterations		
Task Group: T. Seime (PM)		
Explanation of Need: To provide the ability to repair/alter these vessels with a reconstructed UDS.		
July 2022 Meeting Action: T. Sieme presented. This passed SC LB and will be on MC Agenda.		
NOTE: IF APPROVED, RECENTLY PASSED I21-60 CAN BE REMOVED/RECALLED FROM BEING PUBLISHED AS AN INTERP IN NEXT EDITION		

Item Number: A22-17	NBIC Location: Part 3, 4.4.2 & S5.7.2	Attachment 19
General Description: NBIC Part 3, S5.7.2, a), 1) and the examination methods of Part 3, 4.4.2, c		
Subgroup: Repairs and Alterations		
Task Group: None assigned.		
Explanation of Need: An additional examination option is needed for alterations performed to NBIC S5.7.2 a) 1).		
July 2022 Meeting Action: T. McBee presented. The proposal was revised to add leak test shall also be performed with VT. UA as revised.		

Item Number: A22-18	NBIC Location: Part 3, Glossary	Attachment 20
General Description: Definition of blowdown and blowoff		
Subgroup: Repairs and Alterations		
Task Group: K. Moore (PM). M. Quisenberry		
Explanation of Need: These terms are not consistently used throughout the industry. This is to provide guidance to use the correct term when addressing the equipment or the action.		
July 2022 Meeting Action: K. Moore presented. The proposal was compared to ASME Sect. I and B31.1 definitions for consistency. G. Scribner commented on the history of these terms and their use in the industry and Codes and the need for these definitions. M. Quisenberry volunteered for the taskgroup. Rvw & Comment LB to all SG (Part 1, 2, 3, and 4)		

Item Number: A22-19	NBIC Location: Part 3, 5.2.2	No Attachment
General Description: R Certificate Holders with Design Only Scope		
Subgroup: Repairs and Alterations		
Task Group: J. Ferreira (PM), R. Valdez, G. Scribner, B. Schaefer		
Explanation of Need: To add new paragraphs 5.2.2 d) and 5.2.2 e) which will provide guidance for R Certificate Holders with "Design Only" on which activities they are permitted to perform and how they and the Inspectors shall complete the R-2 Form.		
July 2022 Meeting Action: J. Ferreira presented. After discussion, it was pulled back for more work. Several members added to taskgroup. This was a PR.		

Item Number: A22-21	NBIC Location: Part 3, 3.4.4 d)	Attachment 21
General Description: Example of Alteration		
Subgroup: Repairs and Alterations		
Task Group: B. Underwood (PM).		
Explanation of Need: A change in dimension of a pressure retaining item is not considered an alteration in many cases (increasing nozzle/tube thickness, increasing nozzle diameter in some cases...). This revision would provide clarity that only a change in dimension that decreases its pressure retaining capability be considered an alteration.		
July 2022 Meeting Action: B. Underwood presented. This is related to Intent Interp I20-78. Conversations held that I21-12 may need to be resolved before this item can be voted on, but due to this being the last meeting for inclusion into the 2023 Edition, this proposal was motioned for a vote. The proposal was UA.		

10. Future Meetings

- January 2023 – Charleston, SC
- July 2023 – TBD

11. Adjournment at 4:45 PM by Chair Boseo.

Respectfully submitted,

Terrence Hellman

Terrence Hellman

SGR&A Secretary

Sub Group R&A Attendance - July 12, 2022

MEMBERS:	Interest Category	In Person	Remote	Not In Attendance
Boseo, Brian	General Interest	X		
Schaefer, Benjamin	National Board Certificate Holders	X		
Chestnut, Scott	Users			X
Cutlip, Eric	National Board Certificate Holders			X
Davis, Paul	Manufacturers	X		
Frazier, Steven	Jurisdictional Authorities			X
Gilston, Philip	Authorized Inspection Agencies	X		
Hopkins, Craig	National Board Certificate Holders		X	
Johnson, Frank	Users	X		
Kinney, Donald	Jurisdictional Authorities	X		
McBee, Timothy	Authorized Inspection Agencies	X		
Moore, Kathy	National Board Certificate Holders	X		
Morelock, Brian	Users		X	
Quisenberry, Michael	National Board Certificate Holders	X		
Seime, Trevor	Jurisdictional Authorities	X		
Sekely, James	General Interest		X	
Siefert, John	General Interest		X	
Sperko, Walter	General Interest	X		
Spuhl, Raymond	Authorized Inspection Agencies	X		
Toth, Marty	General Interest		X	
Underwood, Robert	Authorized Inspection Agencies	X		
Valdez, Rick		X		
White, Thomas		X		
Walker, Jamie			X	

VISITORS:	Email	In Person	Remote	
Becker, Pat	pabecker@babcock.com	X		Committee Member (In-person)
Galanes, George	ggalanes@diamondtechnicalservices.com	X		Committee Member (In-person)
Jessick, Jerry	jjessick@fusion-etc.com			Committee Member (In-person)
Miletti, Ray	rlmiletti@babcock.com			Committee Member (In-person)
Simmons, Timothy	tsimmons@boilermakers.org	X		Committee Member (In-person)
Troutt, Rob	rob.troutt@tdlr.texas.gov			Committee Member (In-person)
Moedinger, Linn	linnwm@supernet.com			Committee Member (Remote)
Dutra, Louis	Ldutra@babycityboiler.com	X		Visitor (In-person)
Ferreira, Jon	JONATHAN_FERREIRA@HSB.COM	X		Visitor (In-person)
Goossens, Greg	ggoossens@nationalboard.org			Visitor (In-person)
Kennedy, Randy	crkennedy@babcock.com			Visitor (In-person)
Miller, Philip	philip.miller@linde.com	X		Visitor (In-person)
Ponce, Luis	lponce@nationalboard.org	X		Visitor (In-person)
Scribner, Gary	gscribner@nationalboard.org	X		Visitor (In-person)
Skiles, Sean	sean.skiles@fulton-pacific.com			Visitor (In-person)
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Sanghavi, Vishal	vishal.sanghavi@arcosa.com	X		Visitor (Remote)
Schaser, Matt	mschaser@e2g.com		X	Visitor (Remote)
Shah, M. A.	abmindustrialservices@gmail.com		X	Visitor (Remote)
Triplett, Andrew	triplett@ornl.gov		X	Visitor (Remote)
Shanks, Paul			X	
Bates, Jonathan			X	
Richard McIntosh		X		
Bob McGuire			X	

INTENT INTERPRETATION 20-78

Repairs and Alterations of Tube Bundles

Inquiry No.	20-78
Source	Micah Davidian Email: mdavidian@dir.ca.gov Phone: +1 (559) 4456817
Subject	Submission is for R Certificate Holders we provide Repair Inspection services for Background Information: For questions 1-4, NBIC Part 3, 3.3.3 s) seems to allow to be a repair, but under 3.4.4 d) where the dimensions change it might be classified as an alteration.
Edition	2019 Part 3 3.3.3 s) and 3.4.4 d)
Question	<p>Question 1: When a tube bundle is replaced where the new tubesheet material is the same as the original bundle but has a thicker tubesheet due to adding corrosion allowance where the original design did not include corrosion allowance, is this considered a repair or alteration?</p> <p>Question 2: When a tube bundle is replaced where the new tubesheet material is the same as the original bundle but has a thicker tubesheet due to adding additional corrosion allowance to the original design, is this considered a repair or alteration?</p> <p>Question 3: When a tube bundle is replaced where the new tubesheet material is the same as the original bundle but has a thicker tubesheet due to adding thickness for future machining allowance, is this considered a repair or alteration?</p> <p>Question 4: For a tube bundle, does NBIC Part 3, 3.4.4 d) mean that any physical changes e.g. tubesheet thickness, tube wall thickness or length of tubes from the original design will be an alteration?</p> <p>Question 5: If a tube bundle is replaced where the new tubesheet material is the same as the original bundle but has a thicker tubesheet due to ASME Sec VIII, Div. 1, Part UHX tubesheet formulas, is this considered a repair or alteration.</p> <p>Proposed Reply: Question 1: Alteration (calculations required)</p> <p>Question 2: Alteration (calculations required)</p> <p>Question 3: Repair</p> <p>Question 4: Some may be repairs others alterations.</p> <p>Question 5: Alteration (calculations required)</p>
Reply	

<p>Committee's Question</p>	<p>Q1: When a tubesheet in a replacement tube bundle has the same material as the original design but is thicker due to adding corrosion allowance where the original design did not include corrosion allowance or adding additional corrosion allowance or adding a machining allowance, is this considered a repair or alteration?</p> <p>Q2: In the case of a tube bundle, does NBIC Part 3, 3.4.4 d) mean that any physical changes e.g. tubesheet thickness, tube wall thickness or length of tubes from the original design will be an alteration?</p> <p>Q3: When a replacement tube bundle has the same tubesheet material as the original design but is thicker due to a change in the analytic method, is this considered a repair or alteration.</p> <p>Q1: Is it the intent that a change in the dimensions or contour of a pressure-retaining item that decreases its pressure retaining capability be an alteration?</p>
<p>Committee's Reply</p>	<p>A1: Alteration A2: Yes A3, Alteration A1; Yes.</p>
<p>Rationale</p>	<p>Original questions 1,2 &3 have all be rolled up into Q&A1.</p> <p>All, per para 3.4.4 d) a change in dimension or contour of a PRI is an example of an alteration, the tube sheet getting thicker is a change in dimension. The glossary definition of PRI includes material so is not limited to the overall vessel/boiler</p> <p>Q3- I believe this is in reference to a heat exchanger built before Part UHX was adopted into Section VIII Div.1 so would have been built to TEMA rules which aren't 100 % the same as Part UHX. I do not think we should explain how to get around this in the answer to an interpretation.</p> <p><u>Based on revision A22-21 this is the intent of the code</u></p>
<p>SC Vote</p>	
<p>NBIC Vote</p>	
<p>Negative Vote Comments</p>	



PROPOSED INTERPRETATION

Item No. 21-39
Subject/Title Routine repair scope
Project Manager and Task Group Paul Shanks with Phillip Gilston
Source (Name/Email) Paul Shanks / paul.shanks@onecis.com
Statement of Need Some R-certificate holders and AIAs are making huge (100 square feet) weld metal buildup type routine repairs on the basis that the components being built up are only 5" tubes and 3.3.2 e) 1) says welded repairs to 5" tubes are routine. As 3.3.2 e) includes "shall be limited to" shouldn't exceeding any one of the listed limitations preclude the routine repair approach?
Background Information Repairs that exceed the limit listed in 33.2 e) 3) are being conducted which potentially places the public in harm's way.
Proposed Question Q1, In a boiler water wall which has been subject to wastage and requires weld metal build up, does the fact that the tubes are 5" or smaller mean that said build up is always routine regardless of the area involved? Q2 or if the area of weld build up exceeds 100in ² does the size and nature of the component being repaired become irrelevant?
Proposed Reply A1, No A2, Yes
Committee's Question 1 For a repair to be considered routine in nature must it meet all categories in 3.3.2 e)?
Committee's Reply 1 No
Rationale 3.3.2 e) states routine repairs shall be limited to these categories, which are considered individually as discrete items
Committee's Question 2
Committee's Reply 2
Rationale

VOTE:							
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

CODE INTERPRETATIONS

Requests for code Interpretations shall provide the following:

a) Inquiry

Provide a condensed and precise question, omitting superfluous background information and, when possible, composed in such a way that a "yes" or a "no" reply, with brief provisos if needed, is acceptable. The question should be technically and editorially correct.

b) Reply

Provide a proposed reply that clearly and concisely answer the inquiry question. Preferably the reply should be "yes" or "no" with brief provisos, if needed.

c) Background Information

Provide any background information that will assist the committee in understanding the proposed Inquiry and Reply Requests for Code Interpretations must be limited to an interpretation of the particular requirement in the code. The Committee cannot consider consulting type requests such as:

A review of calculations, design drawings, welding qualifications, or descriptions of equipment or Parts to determine compliance with code requirements;

A request for assistance in performing any code-prescribed functions relating to, but not limited to, material selection, designs, calculations, fabrication, inspection, pressure testing, or installation; or

A request seeking the rationale for code requirements.



PROPOSED REVISION OR ADDITION

Item No.: 20-48	
Subject Title: Review "NR" Program requirements against NQA-1 2015 Edition	
NBIC Location: Part 3	
Project Manager and Task Group: Paul Edwards/Ray Spuhl, NR TG	
Source Name and Email:	
Statement of Need: The 2015 Edition of NQA-1 is currently referenced by the 2019 Edition of ASME Section III, Table NCA-7100-2 and by the 2019 Edition of ASME Section XI, Table IWA-1600-1. NBIC Item 20-48 has been opened to review the NR Program in Part 3, Section 1.6, for update to current ASME III and XI QA Program requirements.	
Background Information: <p>Category 1 applications under the NR Program are established for repair / replacement activities on any ASME Section III certified item or system prior to fuel loading, regardless of physical location or installation status. By reference to ASME III, the NBIC QA Program criteria for NR Category 1 applications need to be consistent with the 2015 Edition of NQA-1.</p> <p>Category 2 applications under the NR Program are established for repair / replacement activities on items or systems under the scope of ASME Section XI, regardless of physical location. By reference to ASME XI, the NBIC QA Program criteria for NR Category 2 applications need to be consistent with the 2015 Edition of NQA-1.</p> <p>Category 3 requirements under the NR Program are established for other than ASME III or ASME XI applications and are therefore not directly impacted by NQA-1 - 2015. NBIC Part 3, 1.6.8.1, does, however, permit a Category 3 NR Certificate holder to optionally include QA Program requirements from Category 1 and/or 2 applications, to allow consistency in the NR Certificate holder's QA Program.</p>	
Existing Text: Part 3, 1.6.6.2 d) d) Design Control The provisions identified in ASME NQA-1, Part 1, Requirement 3, shall apply except Paragraph 601. The following additional requirements shall be considered when applicable: 1) The "NR" Certificate Holder shall establish measures to ensure applicable requirements of the owner's design specifications, owner's requirements, and code of construction requirements are	Proposed Test: Part 3, 1.6.6.2 d) d) Design Control The provisions identified in ASME NQA-1, Part 1, Requirement 3, shall apply except Paragraph 601. The following additional requirements shall be considered when applicable: 1) The "NR" Certificate Holder shall establish measures to ensure applicable requirements of the owner's design specifications, owner's requirements, and code of construction requirements are

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<p>correctly translated into drawings, specifications, procedures and instructions.</p> <p>2) All design documents, including revisions, shall be verified by the “NR” Certificate Holder to be correct and adequate in accordance with the owners requirements.</p> <p>3) Repair/replacement plans shall be completed prior to performing any work, inspections, examinations or testing; however repair/replacement plans are not required for the design phase of a repair/ replacement activity including activities that require design only (except rerating).</p> <p>4) The repair/replacement plan (see NBIC Part 3, Table 1.6.9) shall identify any applicable Code Edition/ Addenda and Code Cases, owner’s requirements and the Construction Code Edition/Addenda utilized to perform the work.</p> <p>5) The repair/replacement plan shall identify expected life of the item when less than the intended life as specified in the owner’s design specification.</p> <p>6) The “NR” Certificate Holder shall ensure that specifications, drawings, procedures and instructions do not conflict with the owner’s design specifications. A system must be described in the Quality Assurance Manual to resolve or eliminate such conflicts. Resolution shall consider the Design Specification Requirements, as well as, the owner requirements, Jurisdictional and Regulatory Authority Requirements as applicable.</p>	<p>correctly translated into drawings, specifications, procedures and instructions.</p> <p>2) All design documents, including revisions, shall be verified by the “NR” Certificate Holder to be correct and adequate in accordance with the owners requirements.</p> <p>3) Repair/replacement plans shall be completed prior to performing any work, inspections, examinations or testing; however repair/replacement plans are not required for the design phase of a repair/ replacement activity including activities that require design only (except rerating).</p> <p>4) The repair/replacement plan (see NBIC Part 3, Table 1.6.9) shall identify any applicable Code Edition/ Addenda and Code Cases, owner’s requirements and the Construction Code Edition/Addenda utilized to perform the work.</p> <p>5) The repair/replacement plan shall identify expected life of the item when less than the intended life as specified in the owner’s design specification.</p> <p>6) The “NR” Certificate Holder shall ensure that specifications, drawings, procedures and instructions do not conflict with the owner’s design specifications. A system must be described in the Quality Assurance Manual to resolve or eliminate such conflicts. Resolution shall consider the Design Specification Requirements, as well as, the owner requirements, Jurisdictional and Regulatory Authority Requirements as applicable.</p> <p><u>7) Computer programs used for design analysis shall meet the requirements of NQA-1, Part II, Subpart 2.7 unless independently verified with the design analysis for each application.</u></p>
<p>Part 3, 1.6.6.2 d) s) Audits The provisions identified in ASME NQA-1, Part 1, and Requirement 18 shall apply and shall include the following: A comprehensive system of planned and periodic audits of the “NR” Certificate Holder’s Quality Assurance Program shall be performed. Audit frequency shall be specified in the organization’s Quality Assurance Manual. Audits shall be conducted at least annually (within 12 months) for any ongoing code activity to verify compliance with Quality Assurance Program requirements, performance criteria and to determine the effectiveness of the Quality Assurance Program. When no code work has been performed, the required annual audit need only include those areas of responsibility required to be continually maintained such as training, audits, organizational structure, and Quality Assurance</p>	<p>Part 3, 1.6.6.2 d) s) Audits The provisions identified in ASME NQA-1, Part 1, and Requirement 18 shall apply and shall include the following: A comprehensive system of planned and periodic audits of the “NR” Certificate Holder’s Quality Assurance Program shall be performed. <u>Internal and Supplier</u> Audit frequencyies shall be specified in the organization’s Quality Assurance Manual. <u>Internal</u> Audits shall be conducted at least annually (within 12 months) for any ongoing code activity to verify compliance with Quality Assurance Program requirements, performance criteria and to determine the effectiveness of the Quality Assurance Program. When no code work has been performed, the required annual <u>internal</u> audit need only include those areas of responsibility required to</p>

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<p>Program revisions. The Quality Assurance Manual shall as a minimum describe the following:</p> <ol style="list-style-type: none"> 1) Audits shall be performed in accordance with written procedures or checklists by qualified audit personnel not having direct responsibility in areas being audited; 2) Audit personnel shall be qualified in accordance with the current requirements of ASME NQA-1; 3) Audit results shall be documented and reviewed by responsible management for adequacy and effectiveness of the quality assurance program; 4) Requirements for follow-up actions shall be specified for any deficiencies noted during the audit; 5) Audit records and applicable documentation shall be made available to the Authorized Nuclear Inspection Agency for review; and 6) Audit records shall include as a minimum; <ol style="list-style-type: none"> a. Written procedures; b. Checklists; c. Reports; d. Written replies; and e. Completion of corrective actions. <p>Performance of Authorized Inspection Agency audits required by ASME QAI-1 and NB-263, RCI-1 shall be addressed in the Quality Assurance Manual.</p>	<p>be continually maintained such as training, audits, organizational structure, and Quality Assurance Program revisions <u>etc. External audits (e.g., Supplier audits) of organizations with certification/accreditation permitted by ASME may not be required if acceptable to the Regulatory Authority.</u></p> <p>The Quality Assurance Manual shall as a minimum describe the following:</p> <ol style="list-style-type: none"> 1) Audits shall be performed in accordance with written procedures or checklists by qualified audit personnel not having direct responsibility in areas being audited; 2) Audit personnel shall be qualified in accordance with the current requirements of ASME NQA-1; 3) Audit results shall be documented and reviewed by responsible management for adequacy and effectiveness of the quality assurance program; 4) Requirements for follow-up actions shall be specified for any deficiencies noted during the audit; 5) Audit records and applicable documentation shall be made available to the Authorized Nuclear Inspection Agency for review; and 6) Audit records shall include as a minimum; <ol style="list-style-type: none"> a. Written procedures; b. Checklists; c. Reports; d. Written replies; and e. Completion of corrective actions. <p>Performance of Authorized Inspection Agency audits required by ASME QAI-1 and NB-263, RCI-1 shall be addressed in the Quality Assurance Manual.</p>
<p>Part 3, 1.6.7.2 s) s) Audits A comprehensive system of planned and periodic audits of the "NR" Certificate Holder's Quality Assurance Program shall be performed. Audit frequency shall be specified in the organization's Quality Assurance Manual. Audits shall be conducted at least annually (within 12 months) to verify compliance with Quality Assurance Program requirements, performance criteria and to determine the effectiveness of the Quality Assurance Program. When no code work has been performed, the required annual audit need only include those areas of responsibility required to be continually maintained such as training, audits, organizational structure, Quality Assurance Program revisions, etc. The Quality Assurance Manual shall as a minimum describe the following:</p> <ol style="list-style-type: none"> 1) Audits shall be performed in accordance with written procedures or checklists by qualified audit personnel not having direct responsibility in areas being audited; 2) Audit personnel shall be qualified in accordance with the current requirements of NQA-1; 3) Audit results shall be documented and reviewed by responsible management for adequacy and effectiveness of the quality assurance program; 	<p>Part 3, 1.6.7.2 s) s) Audits A comprehensive system of planned and periodic audits of the "NR" Certificate Holder's Quality Assurance Program shall be performed. <u>Internal and External</u> Audit frequency shall be specified in the organization's Quality Assurance Manual. <u>Internal</u> Audits shall be conducted at least annually (within 12 months) to verify compliance with Quality Assurance Program requirements, performance criteria and to determine the effectiveness of the Quality Assurance Program. When no code work has been performed, the required annual <u>internal</u> audit need only include those areas of responsibility required to be continually maintained such as training, audits, organizational structure, Quality Assurance Program revisions, etc. <u>External audits (e.g., Supplier audits) shall be performed on a triennial basis and supplemented by annual evaluations of the Supplier's performance to determine if the regular schedule audit frequency shall be maintained or decreased or if other corrective action is required. A continuous or ongoing evaluation of the Supplier's performance may be conducted in lieu of the annual evaluations, provided that the results are reviewed in order to determine if corrective</u></p>

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<p>4) Requirements for follow-up actions for any deficiencies noted during the audit;</p> <p>5) Audit records and applicable documentation shall be made available to the Authorized Nuclear Inspection Agency for review; and</p> <p>6) Audit records shall include as a minimum:</p> <ol style="list-style-type: none"> written procedures; checklists; reports; written replies; and completion of corrective actions. <p>Performance of Authorized Inspection Agency audits required by ASME QAI-1 and NB-263, RCI-1 shall be addressed in the Quality Assurance Manual.</p>	<p><u>action is required. A grace period of 90 days may be applied to scheduled audits and annual evaluations of supplier performance. When the grace period is used, the next scheduled date for the activity shall be based on the activity schedule date and not on the date the activity was actually performed. If the activity is performed early, the next schedule date shall be based on the date the activity was actually performed.</u></p> <p>The Quality Assurance Manual shall as a minimum describe the following:</p> <ol style="list-style-type: none"> Audits shall be performed in accordance with written procedures or checklists by qualified audit personnel not having direct responsibility in areas being audited; Audit personnel shall be qualified in accordance with the current requirements of NQA-1; Audit results shall be documented and reviewed by responsible management for adequacy and effectiveness of the quality assurance program; Requirements for follow-up actions for any deficiencies noted during the audit; Audit records and applicable documentation shall be made available to the Authorized Nuclear Inspection Agency for review; and Audit records shall include as a minimum: <ol style="list-style-type: none"> written procedures; checklists; reports; written replies; and completion of corrective actions. <p>Performance of Authorized Inspection Agency audits required by ASME QAI-1 and NB-263, RCI-1 shall be addressed in the Quality Assurance Manual.</p>
<p>Part 3, 1.6.8.2 s)</p> <p>s) Audits</p> <p>A comprehensive system of planned and periodic audits of the “NR” Certificate Holder’s Quality Assurance Program shall be performed. Audit frequency shall be specified in the organization’s Quality Assurance Manual. Audits shall be conducted at least annually (within 12 months) to verify compliance with Quality Assurance Program requirements, performance criteria and to determine the effectiveness of the Quality Assurance Program. When no code work has been performed, the required annual audit need only include those areas of responsibility required to be continually maintained such as training, audits, organizational structure, Quality Assurance Program revisions, etc. The Quality Assurance Manual shall as a minimum describe the following:</p> <ol style="list-style-type: none"> Audits shall be performed in accordance with written procedures or checklists by qualified audit personnel not having direct responsibility in areas being audited; 	<p>Part 3, 1.6.8.2 s)</p> <p>s) Audits</p> <p>A comprehensive system of planned and periodic audits of the “NR” Certificate Holder’s Quality Assurance Program shall be performed. Audit frequency shall be specified in the organization’s Quality Assurance Manual. Audits shall be conducted at least annually (within 12 months) to verify compliance with Quality Assurance Program requirements, performance criteria and to determine the effectiveness of the Quality Assurance Program. When no code work has been performed, the required annual audit need only include those areas of responsibility required to be continually maintained such as training, audits, organizational structure, Quality Assurance Program revisions, etc. The Quality Assurance Manual shall as a minimum describe the following:</p> <ol style="list-style-type: none"> Audits shall be performed in accordance with written procedures or checklists by qualified audit personnel not having direct responsibility in areas being audited;

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2) Audit personnel shall be qualified in accordance with recognized standards, such as NQA-1;
3) Audit results shall be documented and reviewed by responsible management for adequacy and effectiveness of the quality assurance program;
4) Requirements for follow-up actions for any deficiencies noted during the audit;
5) Audit records and applicable documentation shall be made available to the Authorized Nuclear Inspection Agency for review;
6) Audit records shall include as a minimum:
a. written procedures;
b. checklists;
c. reports;
d. written replies; and
e. completion of corrective actions.
Performance of Authorized Inspection Agency audits required by ASME QAI-1 and NB-263, RCI-1 shall be addressed in the Quality Assurance Manual.

2) Audit personnel shall be qualified in accordance with recognized standards, such as NQA-1;
3) Audit results shall be documented and reviewed by responsible management for adequacy and effectiveness of the quality assurance program;
4) Requirements for follow-up actions for any deficiencies noted during the audit;
5) Audit records and applicable documentation shall be made available to the Authorized Nuclear Inspection Agency for review;
6) Audit records shall include as a minimum:
a. written procedures;
b. checklists;
c. reports;
d. written replies; and
e. completion of corrective actions.
Performance of Authorized Inspection Agency audits required by ASME QAI-1 and NB-263, RCI-1 shall be addressed in the Quality Assurance Manual.



**THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS**

PROPOSED REVISION OR ADDITION

Form "R" Reports, Records, or Documents	Instructions	Minimum Retention Period
d) Administrative record review of the "R" Certificate Holder's administrative processes.	Records supporting completed administrative reviews or audits of procedures or processes required by the "R" Certificate Holder's Quality System Manual, or in combination with the applicable part of the NBIC Part 3, Supplement 6 as it applies to the identified scope listed on the "R" <i>Certificate of Authorization</i> .	Subject to review during the triennial evaluation of the certificate holder's Quality System.

1.6 "NR" PROGRAM REQUIREMENTS

1.6.1 SCOPE

- a) This section provides requirements that must be met for an organization to obtain a National Board *Certificate of Authorization* to use the "NR" Symbol Stamp for repair/replacement activities to nuclear items constructed in accordance with the requirements of the ASME Code or other internationally recognized codes or standards for construction or inservice inspection of nuclear facilities.
- b) For administrative requirements to obtain or renew a National Board "NR" *Certificate of Authorization* and the "NR" Symbol Stamp, refer to National Board Procedure NB-417, *Accreditation of "NR" Repair Organizations*.

1.6.2 GENERAL

- a) An organization applying for an "NR" *Certificate of Authorization* shall have a written Quality Assurance Program (QAP) that details the specific requirements to be met based on the intended category of activities selected by that organization as described below and shown in Table 1.6.2. Controls used, including electronic capabilities, in the Quality Assurance Program shall be documented in a Quality Assurance Manual (QAM). Controls required to be included within the QAM shall include who, what, when, where, why and how with an understanding that the how can be a reference to an implementation procedure or instruction. Quality activities to be described in the Quality Assurance Program are identified in Section 1.6.5 of this part. Applicants shall address all requirements in their Quality Assurance Program based on the category of activity and scope of work to be performed (organization's capabilities) to which certification is requested.

1) Category 1

Any ASME Section III Code certified item or system requiring repair/replacement activities irrespective of physical location and installation status prior to fuel loading.

2) Category 2

After fuel loading, any item or system under the scope of ASME Section XI requiring repair/replacement activities irrespective of physical location. Based on regulatory or jurisdictional acceptance, Category 2 may be used prior to fuel loading.

3) Category 3

Items other than those covered by Category 1 or Category 2, requiring repair/replacement activities irrespective of physical location, installation status and fuel loading.

REVISE TO READ: ASME Section XI Division 1

- b) Repair organizations performing repairs of pressure relief devices in nuclear service shall meet the additional requirements of NBIC Part 4, Section 4 and NBIC Part 4, Supplement 6.

TABLE 1.6.2**“NR” QUALITY ASSURANCE PROGRAM (QAP) REQUIREMENTS**

Category of Activity	Owner	Organizations other than Owner
Category 1	10 CFR Part 50 Appendix B ^{1,2} and ASME Section III NCA-4000 & NQA-1 Part 1	10 CFR Part 50 Appendix B ^{1,2} and ASME Section III NCA-4000 & NQA-1 Part 1
Category 2	10 CFR Part 50, Appendix B ^{1,2} or NQA-1 ³ , Part 1 and ASME Section XI IWA-4142	10 CFR Part 50, Appendix B ^{1,2} supplemented as needed with Owner’s QA program; or ASME NQA-1 ³ , Part 1; or ASME Section III, NCA-4000
Category 3	ASME NQA-1, Part 1, or Specify the Standard to which certification is desired	ASME NQA-1 ³ , Part 1, or Specify the Standard to which certification is desired
Note 1: Code of Federal Regulations (CFR) – rules and regulations published by the executive departments and agencies of the federal government of the United States.		
Note 2: 10 CFR 50 Appendix B – Title 10 of the Code of Federal Regulations Part 50 Appendix B describes the quality assurance criteria for nuclear plants and fuel reprocessing plants.		
Note 3: The Edition (and Addenda, as applicable) of NQA-1 to be utilized shall be the latest endorsed by the Regulatory Authority, or as specified in the Owner’s QA Program description reviewed and approved by the Regulatory Authority.		

1.6.2.1 DEFINITIONS

The NBIC terms and definitions shall be supplemented, as applicable, by the terms and definitions of ASME Section III, Section XI, NQA-1, or other standards specified by the Regulatory Authority.

The following terms are as defined in the NBIC Glossary of Terms Section 9:

- Authorized Inspection Agency
- Authorized Nuclear Inspection Agency
- Jurisdiction
- “NR” Certificate Holder

TABLE 1.6.2.1
ACRONYMS

ASME	American Society of Mechanical Engineers
Applicant	An Organization applying for “NR” <i>Certificate of Authorization</i> (new or renewal)
CFR	Code of Federal Regulations
Code	ASME Code of Construction, Section III, Division I, (NCA, NB, NC, ND, NE, NF, NG, and NH) or ASME Section XI Rules for Inservice Inspection of Nuclear Power Plant Components as applicable.
Jurisdiction	Revise to read: ASME Section XI Division 1 National Board of Boiler and Pressure Vessel Inspectors
NB	National Board of Boiler and Pressure Vessel Inspectors
NBIC	National Board Inspection Code
NB-263, RCI-1	Rules for Commissioned Inspectors
NCA	ASME Section III, Subsection NCA, General Requirements for Division 1 and Division 2
NQA-1*	ASME Quality Assurance Requirements for Nuclear Facility Applications
NR	Nuclear Repair
“NR” CH	“NR” Certificate Holder
QA	Quality Assurance
QAI-1	ASME Qualifications for Authorized Inspection
QAM	Quality Assurance Manual
QAP	Quality Assurance Program
QC	Quality Control
WA	ASME Section III, Division 3, Subsection WA, General Requirements

Note:

* Edition(s) endorsed by the Regulatory Authority

1.6.3 PREREQUISITES FOR ISSUING A NATIONAL BOARD “NR” CERTIFICATE OF AUTHORIZATION (21)

Before an organization can obtain a National Board “NR” *Certificate of Authorization*, the organization shall:

- a) Have and maintain an inspection agreement with an Authorized Nuclear Inspection Agency accepted in accordance with NB-360, *National Board Acceptance of Authorized Inspection Agencies (AIA) Accredited by the American Society of Mechanical Engineers (ASME)*, with accreditation to perform repair and alteration acceptance inspections.
- b) Have a written Quality Assurance Program which includes the quality assurance manual and any supporting procedures, instructions and specifications required to comply with this section. The Quality Assurance Program shall address all controls for the intended category and scope of activities requested.
- c) Have a current edition of the NBIC.

- d) Have available ASME Section XI, the code of construction and referenced code sections and standards appropriate for the scope of work to be performed. ASME Section XI and codes of construction (Editions/Addenda) shall meet the requirements of the Regulatory Authority and the owner.

Revise to read: ASME
Section XI Division 1

MAINTAINING OR RENEWING A NATIONAL BOARD "NR" CERTIFICATE OF AUTHORIZATION

Revise to read: ASME
Section XI Division 1

- a) Before an "NR" *Certificate of Authorization* will be issued or renewed, the applicant must have the Quality Assurance Program and the implementation of the program reviewed and found acceptable by representatives of the National Board, the Jurisdiction, and the Authorized Nuclear Inspection Agency. The Jurisdiction will be the National Board Member Jurisdiction in which the applicant is located or the location where the Quality Assurance Program is demonstrated/implemented. At the request of the Jurisdiction, or where there is no National Board Member Jurisdiction, the National Board representative shall act on behalf of the Jurisdiction. The implementation of the Quality Assurance Program shall be satisfactorily demonstrated by the organization. Demonstration of implementation shall meet the most stringent (classification) code requirements for the scope and category of work to be specified on the *Certificate of Authorization* or as requested by the applicant.
- b) If the applicant is an ASME "N" type *Certificate of Authorization* holder, has satisfactorily demonstrated within the last twelve (12) months the implementation of their Quality Assurance Program and can provide documentation that the organization is capable of implementing its Quality Assurance Program as being in compliance with this section, a further hardware verification implementation may not be necessary.
- c) The Regulatory Authority or Jurisdiction, upon request to the National Board, may attend the survey process for an "NR" *Certificate of Authorization* to be issued or renewed.
- d) The "NR" *Certificate of Authorization* holder shall be subject to an audit annually by the Authorized Nuclear Inspection Agency to ensure compliance with the Quality Assurance Program.

1.6.5 QUALITY ASSURANCE PROGRAM

- a) An applicant or a holder of a National Board "NR" *Certificate of Authorization* ("NR" Certificate Holder) shall have and maintain a written Quality Assurance Program. The Quality Assurance Program shall satisfactorily meet the requirements of this section, and Jurisdictional and Regulatory requirements as applicable. The Quality Assurance Program may be brief or voluminous, depending on the circumstances. It shall be treated confidentially by the National Board and available for review by the Survey Team.
- b) Each applicant or "NR" Certificate Holder is responsible for establishing and executing a Quality Assurance Program. The applicant or "NR" Certificate Holder may subcontract activities needed to implement the Quality Assurance Program, as limited by ASME Section III and XI, but responsibility for adherence to the Quality Assurance Program remains with the Applicant or "NR" Certificate Holder.
- c) These rules set forth the requirements for planning, managing, and implementing the Quality Assurance Program to control and ensure quality is performed and maintained during repair/replacement activities of components, items, parts, and systems for nuclear facilities. These rules are to be the basis for evaluating such programs prior to the issuance or renewal of the National Board "NR" *Certificate of Authorization*. Rules identified in subsections 1.6.6, 1.6.7 and 1.6.8 of this section detail the Quality Assurance Program requirements for each category of activity. These rules are established to meet and follow the requirements specified in NBIC Part 3, Table 1.6.2 of this section.

Revise to read: ASME
Section XI Division 1

1.6.6 QUALITY ASSURANCE PROGRAM REQUIREMENTS FOR CATEGORY 1 ACTIVITIES

1.6.6.1 SCOPE

Owners or organizations other than owners shall have a written Quality Assurance Program meeting the criteria specified in NBIC Part 3, Table 1.6.2 for Category 1 activities. The following quality elements shall be specified and described within the QAM.

1.6.6.2 QUALITY PROGRAM ELEMENTS

(21)

a) Organization

The provisions identified in ASME NQA-1, Part 1, Requirement 1, shall apply in its entirety. The authority and responsibility for individuals involved in activities affecting quality shall be clearly established and documented throughout the Quality Assurance Program and identified on a functional organizational chart contained within the QA Manual.

b) Statement of Policy and Authority shall:

- 1) identify the titles of individuals who have the authority and responsibility charged with ensuring the quality program is implemented as described;
- 2) confirm their freedom in the organization to identify quality problems and to initiate, recommend and provide solutions;
- 3) include a statement that if there is a disagreement in the implementation of the quality assurance program, the matter is to be referred for resolution to a higher authority and shall be resolved in a manner that will not conflict with code, jurisdiction/regulatory authority or quality program requirements;
- 4) include a statement of the full support of management; and
- 5) be dated and signed by a senior management official within the organization.

c) Quality Assurance Program (QAP)

The provisions identified in ASME NQA-1, Part 1, Requirement 2, shall apply, except paragraph 301. Additionally, the following criteria shall be used when developing and maintaining the QAP.

- 1) The Quality Assurance Program as used in this section shall include a written Quality Assurance Manual, with supporting procedures and instructions used to meet all the requirements of this Section.
- 2) Qualification of non-destructive examination personnel shall be as required by the code of construction or as specified in the owner's Quality Assurance Program.
- 3) The "NR" Certificate Holder shall be responsible for advising the Authorized Nuclear Inspection Agency of proposed changes to the Quality Assurance Manual to obtain acceptance of the Authorized Nuclear Inspector Supervisor before putting such changes into effect. The "NR" Certificate Holder shall make a current controlled copy of the Quality Assurance Manual available to the Authorized Nuclear Inspector and Authorized Nuclear Inspector Supervisor. The Certificate Holder shall be responsible for notifying the Authorized Nuclear Inspector of QAM changes, including evidence of acceptance by the Authorized Nuclear Inspector Supervisor.
- 4) The Quality Assurance Manual need not be in the same format or sequential arrangement as the requirements in these rules as long as all applicable requirements have been covered.

- 5) The "NR" Certificate Holder shall implement and maintain a program for qualification, indoctrination, training and maintaining proficiency of personnel involved with quality functions, including personnel of subcontracted services.
- 6) The "NR" Certificate Holder shall address in their QAM the requirements for interfacing with the owner specified in NBIC Part 3, 1.6.9.
- 7) Specified controls including responsibilities for personnel shall be described in the quality assurance program.

d) Design Control

The provisions identified in ASME NQA-1, Part 1, Requirement 3, shall apply except Paragraph 601. The following additional requirements shall be considered when applicable:

- 1) The "NR" Certificate Holder shall establish measures to ensure applicable requirements of the owner's design specifications, owner's requirements, and code of construction requirements are correctly translated into drawings, specifications, procedures and instructions.
- 2) All design documents, including revisions, shall be verified by the "NR" Certificate Holder to be correct and adequate in accordance with the owners requirements.
- 3) Repair/replacement plans shall be completed prior to performing any work, inspections, examinations or testing; however repair/replacement plans are not required for the design phase of a repair/replacement activity including activities that require design only (except rerating).
- 4) The repair/replacement plan (see NBIC Part 3, Table 1.6.9) shall identify any applicable Code Edition/Addenda and Code Cases, owner's requirements and the Construction Code Edition/Addenda utilized to perform the work.
- 5) The repair/replacement plan shall identify expected life of the item when less than the intended life as specified in the owner's design specification.
- 6) The "NR" Certificate Holder shall ensure that specifications, drawings, procedures and instructions do not conflict with the owner's design specifications. A system must be described in the Quality Assurance Manual to resolve or eliminate such conflicts. Resolution shall consider the Design Specification Requirements, as well as, the owner requirements, Jurisdictional and Regulatory Authority Requirements as applicable.

e) Procurement Document Control

The provisions identified in ASME NQA-1, Part 1, Requirement 4, shall apply. Procurement documents shall require suppliers to provide a Quality Assurance Program consistent with the applicable requirements of ASME Section III and this section.

f) Instructions, Procedures, and Drawings

The provisions identified in ASME NQA-1, Part 1, Requirement 5, shall apply. All activities affecting quality shall be prescribed by documented instructions, procedures or drawings appropriate for the scope of work to be performed. Instructions, procedures or drawings shall describe acceptance criteria to ensure quality activities are accomplished.

g) Document Control

The provisions identified in ASME NQA-1, Part 1, Requirement 6, shall apply. The Quality Assurance Program shall detail measures to control the preparation, review, issuance, use, approval and distribution of all documents related to quality as identified in the applicants Quality Assurance Program. Revisions shall meet the same requirements as the originals unless the applicant specifies other

measures within their program. Measures shall ensure the latest approved documents represent the repair/replacement activities performed.

h) Control of Purchased Material, Items, and Services

The provisions identified in ASME NQA-1, Part 1, Requirement 7 shall apply, except:

- 1) Procurement of Authorized Inspection Agency services is not applicable as specified in paragraph 507.
- 2) The decision to perform bid evaluation as described in paragraph 300 is the responsibility of the "NR" Certificate Holder.
- 3) For Certificates of Conformance specified in paragraph 503 changes, waivers, or deviations including resolution of non-conformances must meet the requirements of ASME Section III and this Section.
- 4) The provisions identified in ASME NQA-1, Part 1, Requirement 7, paragraph 700 are not applicable to this section.
- 5) Documentary evidence for items shall conform to the requirements of ASME Section III, NCA and this Section. Materials shall meet the material certification requirements as specified in ASME Section III, NCA-3800 or NCA-4470 as applicable. Documented evidence for ASME stamped items is satisfied by a Manufacturer's Data Report. Utilization of unqualified source material shall meet the requirements of ASME Section III, NCA-4255.5.
- 6) The "NR" Certificate Holder may obtain items from an owner, provided the owner provides the required documentation and items are identified to meet Code and the Certificate Holders Quality Assurance Program. The "NR" Certificate Holder shall not be required to audit the owner as an approved supplier, provided the items used are exclusively for the owner and the owner procured and controlled the items under the owner's Quality Assurance Program.
- 7) The Quality Assurance Program shall establish controls to ensure all purchased materials, items, and services conform to the requirements of the owner's design specifications and the code of construction Edition/Addenda used to perform the work. Materials shall meet the requirements specified in ASME Section III, NCA-3800 or NCA-4470 as applicable.

i) Identification and Control of Items

The provisions identified in ASME NQA-1, Part 1, Requirement 8, shall apply and include the following additional requirements:

- 1) Controls shall assure only correct and acceptable items, parts and components are used or installed when performing repair/replacement activities.
- 2) Welding, brazing and fusing materials shall be identified and controlled.
- 3) Required Certified Material Test Reports and Certificates of Conformance shall be received, traceable to the items, reviewed to comply with the material specification and found acceptable.
- 4) The "NR" Certificate Holder shall utilize checklists to identify required characteristics using accepted procedures, compliance with records received, results of examinations and tests performed, range of values when required, and spaces for inclusion of document numbers and revision levels, signatures initials / stamps and dates of examinations or tests performed, verified, and/or witnessed by the "NR" Certificate Holder's qualified Representative and Authorized Nuclear Inspector.

j) Control of Processes

The provisions identified in ASME NQA-1, Part 1, Requirement 9, shall apply. Documents used to control processes shall include spaces for signatures, initials, stamps and dates that activities were performed by the Certificate Holder's representative and the Authorized Nuclear Inspector when the processes conforms to the specified acceptance criteria as listed on drawings, procedures, instructions, specifications or other appropriate documents including revisions.

k) Examinations, Tests, and Inspections

The provisions identified in ASME NQA-1, Part 1, Requirement 10, shall apply, except paragraph 700 for inspections during operations is not required.

- 1) A repair/replacement plan shall be described in the Quality Assurance Manual that addresses required information to perform the work needed for repair/replacement activities. Spaces shall be included for mandatory hold points where witnessing is required by the "NR" Certificate Holder's Qualified Representative, the Authorized Nuclear Inspector or the owner's representative, if required. Work shall not proceed beyond designated mandatory hold points without documented consent as appropriate.
- 2) The following guidance is provided for information to be included within the repair/replacement plan:
 - a. A detailed description of repair/replacement activities to be performed;
 - b. Describe any defects and examination methods used to detect the defects;
 - c. Defect removal method and requirements for identifying reference points;
 - d. Any procedures including revisions utilized; (e.g. welding, brazing, heat treat, examination, testing) and material requirements;
 - e. Required documentation and stamping;
 - f. Acceptance criteria used to verify acceptability; and
 - g. Applicable Code editions/addenda and code cases.
- 3) Repair/Replacement plans and evaluations shall be subject to review by the Jurisdictional and Regulatory Authority when required.

l) Test Control

The provisions identified in ASME NQA-1, Part 1, Requirement 11 shall apply. Testing shall be performed in accordance with written test procedures with acceptance criteria clearly defined. Prerequisites for performing each test to include calibration, equipment, trained personnel, environmental conditions and provisions for data acquisition shall be described. Test results shall be documented and evaluated by qualified personnel.

m) Control of Measuring and Test Equipment

The "NR" Certificate Holder may utilize calibration and test activities performed by subcontractors when surveys and audits are performed. As an alternative to performing a survey and audit for procuring Laboratory Calibration and Test Services, the "NR" Certificate Holder as documented in their Quality Program may accept accreditation of an International Calibration and Test Laboratory Services by the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) provided this alternative method is described in the "NR" Certificate Holder's Quality Program and the following requirements are met:

- 1) The “NR” Certificate Holder shall review and document verification that the supplier of calibration or test services was accredited by an accredited body recognized by the ILAC MRA encompassing ISO/IEC-17025:2005 or 2017, “General Requirements for the Competence of Testing and Calibration Laboratories”.
 - 2) For procurement of calibration services, the published scope of accreditation for the calibration laboratory covers the needed measurement parameters, ranges and uncertainties.
 - 3) For procurement of testing services, the published scope of accreditation for the test laboratory covers the needed testing services including test methodology and tolerances/uncertainty.
 - 4) The “NR” Certificate Holder’s purchase documents shall include:
 - a. Service provided shall be in accordance with their accredited ISO/IEC-17025:2005 or 2017 program and scope of accreditation;
 - b. As-found calibration data shall be reported in the certificate of calibration when items are found to be out-of-calibration;
 - c. Standards used to perform calibration shall be identified in the certificate of calibration;
 - d. Notification of any condition that adversely impacts the laboratories ability to maintain the scope of accreditation;
 - e. Any additional technical and/or quality requirements, as necessary, which may include tolerances, accuracies, ranges, and standards; and
 - f. Service suppliers shall not subcontract services to any other supplier.
 - 5) The “NR” Certificate Holder shall upon receipt inspection, validate that the laboratory documentation certifies that:
 - a. Services provided by the laboratory has been performed in accordance with their ISO/IEC-17025:2005 or 2017 program and performed within their scope; and
 - b. Purchase order requirements have been met.
- n) Handling, Storage, and Shipping
- The provisions of ASME NQA-1, Part 1, and Requirement 13 shall apply.
- o) Quality Assurance Records
- The provisions identified in ASME NQA-1, Part 1, Requirement 17, shall apply, except Paragraphs 400, 500, and 600 are not applicable. The following requirements shall be followed:
- 1) Records shall be identifiable and retrievable;
 - 2) Records shall be retained consistent with the owners requirements for duration, location and assigned responsibility;
 - 3) Forms NR-1 and NVR-1 as applicable shall be completed by the “NR” Certificate Holder upon completion of all repair/replacement activities. Completion of forms, registrations and stamping of the “NR” symbol stamp shall meet the requirements of NBIC Part 3, Section 5. A log shall be maintained in accordance with NBIC Part 3, 5.6;
 - 4) Lifetime and non-permanent records shall be as specified in ASME Section III, NCA-4134, Tables NCA-4134.17-1, and 4134.17-2;

- 5) Radiographs (digital images or film) may be reproduced provided that:
 - a. The process shall be subject to owner's approval;
 - b. The "NR" Certificate Holder is responsible for the process used and shall include a system for controlling and monitoring the accuracy so that the image will provide the same information as the original; and
 - c. Procedures shall contain requirements for exposure scanning, focusing, contrast, resolution and distinguishing film artifacts as applicable for reproduced images.
- 6) Records shall be classified, maintained and indexed and shall be accessible to the owner, owner's designee, and the Authorized Nuclear Inspector; and
- 7) When the "NR" Certificate Holder is the owner, designated records and reports received by the owner, shall be filed and maintained in a manner to allow access by the Authorized Nuclear Inspector. Suitable protection from deterioration and damage shall be provided by the owner. All records and reports shall be retained as specified in the owners QAP for the lifetime of the component or system.

p) Corrective Action

The provisions identified in ASME NQA-1, Part 1, Requirement 16 shall apply.

- 1) Measures shall be established to ensure that conditions adverse to quality such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and other non-conformances are promptly identified and corrected.
- 2) In the case of significant conditions adverse to quality, the measures shall also ensure that the cause of these conditions be determined and corrected to preclude repetition. The identification of significant conditions adverse to quality, the cause, condition, and the corrective action taken shall be documented and reported to the appropriate levels of management.
- 3) These requirements shall also extend to the performance of subcontractors' corrective action measures.

q) Inspection or Test Status (not to include operating status)

The provisions identified in ASME NQA-1, Part 1, Requirement 14 shall apply. Measures shall be established to indicate inspection and test status of parts, items, or components during the repair/replacement activity. The system used shall provide positive identification of the part, item, or component by means of stamps, labels, routing cards, or other acceptable methods. The system shall include any procedures or instructions necessary to achieve compliance. Procedures shall be provided for the identification of acceptable and unacceptable items and for the control of status indicators. The authority for application and removal of status indicators shall also be specified.

r) Nonconforming Materials or Items

The provisions identified in ASME NQA-1, Part 1, Requirement 15 shall apply. Measures shall be established to control materials or items that do not conform to requirements to prevent their inadvertent use, including measures to identify and control the proper installation of items and to preclude nonconformance with the requirements of these rules. These measures shall include procedures for identification, documentation, segregation when practical, and disposition. Nonconforming items shall be reviewed for acceptance, rejection, or repair in accordance with documented procedures. The responsibility and authority for the disposition of nonconforming items shall be defined. Repaired or replaced items shall be re-examined in accordance with the applicable procedures. Measures that control further processing of a nonconforming or defective item, pending a decision on its disposition, shall be established and maintained. Ultimate disposition of nonconforming items shall be documented.

s) Audits

The provisions identified in ASME NQA-1, Part 1, and Requirement 18 shall apply and shall include the following:

A comprehensive system of planned and periodic audits of the “NR” Certificate Holder’s Quality Assurance Program shall be performed. Audit frequency shall be specified in the organization’s Quality Assurance Manual. Audits shall be conducted at least annually (within 12 months) for any ongoing code activity to verify compliance with Quality Assurance Program requirements, performance criteria and to determine the effectiveness of the Quality Assurance Program. When no code work has been performed, the required annual audit need only include those areas of responsibility required to be continually maintained such as training, audits, organizational structure, and Quality Assurance Program revisions. The Quality Assurance Manual shall as a minimum describe the following:

- 1) Audits shall be performed in accordance with written procedures or checklists by qualified audit personnel not having direct responsibility in areas being audited;
- 2) Audit personnel shall be qualified in accordance with the current requirements of ASME NQA-1;
- 3) Audit results shall be documented and reviewed by responsible management for adequacy and effectiveness of the quality assurance program;
- 4) Requirements for follow-up actions shall be specified for any deficiencies noted during the audit;
- 5) Audit records and applicable documentation shall be made available to the Authorized Nuclear Inspection Agency for review; and
- 6) Audit records shall include as a minimum;
 - a. Written procedures;
 - b. Checklists;
 - c. Reports;
 - d. Written replies; and
 - e. Completion of corrective actions.

Performance of Authorized Inspection Agency audits required by ASME QAI-1 and NB-263, RCI-1 shall be addressed in the Quality Assurance Manual.

t) Authorized Nuclear Inspector

Measures shall be taken to reference the commissioned rules for National Board Authorized Nuclear Inspector, in accordance with NB-263, RCI-1 *Rules for Commissioned Inspectors*. The “NR” Certificate Holder shall ensure that the latest documents including the Quality Assurance Manual, procedures and instructions are made available to the Authorized Nuclear Inspector. The Authorized Nuclear Inspector shall be consulted prior to the issuance of a repair/replacement plan by the “NR” Certificate Holder in order that the Authorized Nuclear Inspector may select any in-process inspection or hold points when performing repair/replacement activities. The “NR” Certificate Holder shall keep the Authorized Nuclear Inspector informed of progress of the repair/replacement activity so that inspections may be performed. The Authorized Nuclear Inspector shall not sign Form NR-1 or Form NVR-1, as applicable, unless satisfied that all work carried out is in accordance with this Section. The Authorized Nuclear Inspector and Authorized Nuclear Inspector Supervisor shall have access to areas where work is being performed including subcontractors facilities in order to perform their required duties. The ANI shall be involved in dispositions and verification for non-conformances and corrective actions involving quality or code requirements.

u) Exhibits

Forms and exhibits referenced in the Quality Assurance Manual shall be explained in the text and included as part of the referencing document or as an appendix to the Quality Assurance Manual. Forms shall be controlled and identified to show the latest approved revision, name, and other corresponding references as stated in the Quality Assurance Manual.

1.6.7 QUALITY ASSURANCE PROGRAM REQUIREMENTS FOR CATEGORY 2 ACTIVITIES

1.6.7.1 SCOPE

Revise to read: ASME
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Organizations other than owners shall have a written Quality Assurance Program meeting one of the criteria specified in Table 1.6.2 of this section. Organizations applying for a Category 2 "NR" *Certificate of Authorization* shall specify in their written Quality Assurance Program which program criteria their Quality Assurance Program follows. Owners shall have a Quality Assurance Program meeting the requirements of either 10 CFR 50, Appendix B or NQA-1 Part 1 and shall include the additional requirements specified in ASME Section XI, IWA-4142 when applicable. Organizations other than the owner shall comply with requirements specified in either 10 CFR 50, Appendix B supplemented as needed with the owner's QAP; NQA-1 Part 1; or NCA-4000. Organizations may elect to choose to follow all the rules specified in one of the allowed QAP criteria specified in Table 1.6.2 or they may elect to combine or supplement requirements from other specified QAP's. When organizations elect to combine QAP requirements, it shall be clearly specified and understood in the QAM which QAP requirement is being followed for each activity specified in their QAM. The following quality elements shall be specified and described within the QAM.

(21) 1.6.7.2 QUALITY PROGRAM ELEMENTS

a) Organization

The authority and responsibility for individuals involved in activities affecting quality shall be clearly established and documented throughout the Quality Assurance Program and identified on a functional organizational chart contained within the QA Manual.

b) Statement of Policy and Authority shall:

- 1) identify the titles of individuals who have the authority and responsibility charged with ensuring the quality program is implemented as described;
- 2) confirm their freedom in the organization to identify quality problems and to initiate, recommend and provide solutions;
- 3) include a statement that if there is a disagreement in the implementation of the quality assurance program, the matter is to be referred for resolution to a higher authority and shall be resolved in a manner that will not conflict with code, jurisdiction/regulatory authority or quality program requirements;
- 4) include a statement of the full support of management; and
- 5) be dated and signed by a senior management official within the organization.

c) Quality Assurance Program (QAP)

- 1) Qualification of non-destructive examination personnel shall be as required by the code or as specified in the owner's Quality Assurance Program.

- 2) Prior to returning an item to service, the owner shall evaluate the suitability of the item subjected to the repair/replacement activity. Corrective actions shall be taken when an item is determined to be deficient or does not satisfy the requirements of this section.
 - 3) The "NR" Certificate Holder shall provide a copy of the Quality Assurance Manual to the owner for review and acceptance. The "NR" Certificate Holder shall make a current controlled copy of the Quality Assurance Manual available to the Authorized Nuclear Inspector and Authorized Nuclear Inspector Supervisor. When a repair/replacement activity is split between the owner and an "NR" Certificate Holder, each Quality Assurance Program shall comply with this section for their respective activities. The owner shall establish interfaces for assuring this section is met for the two Quality Assurance Programs.
 - 4) The "NR" Certificate Holder shall be responsible for advising the Authorized Nuclear Inspection Agency of proposed changes to the Quality Assurance Manual to obtain acceptance of the Authorized Nuclear Inspector Supervisor before putting such changes into effect. The Certificate Holder shall be responsible for notifying the Authorized Nuclear Inspector of QAM changes, including evidence of acceptance by the Authorized Nuclear Inspector Supervisor.
 - 5) The Quality Assurance Manual need not be in the same format or sequential arrangement as the requirements in these rules as long as all applicable requirements have been covered.
 - 6) The "NR" Certificate Holder shall implement and maintain a program for qualification, indoctrination, training and maintaining proficiency of personnel involved with quality functions, including personnel of subcontracted services.
 - 7) The "NR" Certificate Holder shall address in their QAM the requirements for interfacing with the owner specified in 1.6.9 of this section.
 - 8) Specified controls including responsibilities for personnel shall be described in the quality assurance program.
- d) Design Control
- 1) Repair/replacement activities, code edition and addenda used shall correspond with the owner's Inservice Inspection Program unless later code editions and addenda have been accepted by the owner, the Enforcement and/or the Regulatory authority having jurisdiction at the plant site.
 - 2) The repair/replacement plan (see NBIC Part 3, 1.6.7.2 j)) shall identify expected life of the item when less than the intended life as specified in the owner's requirements and the owner shall be advised of the condition.
 - 3) "NR" Certificate Holder shall assure that specifications, drawings, procedures and instructions do not conflict with the owner's requirements. A system must be described in the Quality Assurance Manual to resolve or eliminate such conflicts. Resolution shall consider the design specification requirements, as well as, the owner Requirements, Jurisdictional and Regulatory requirements as applicable.
 - 4) ASME Section XI establishes that the owner is responsible for design in connection with repair/replacement activities. The "NR" Certificate Holder must ensure that the design specification, drawings, or other specifications or instructions furnished by the owner satisfy the code edition and addenda of the owner's requirements. To satisfy this requirement, the "NR" Certificate Holder shall establish requirements that correctly incorporate the owner's requirements into their specifications, drawings, procedures, and instructions, which may be necessary to carry out the work. The "NR" Certificate Holder's system shall include provisions to ensure that the appropriate quality standards are specified and included in all quality records. These records shall be reviewed for compliance with the owner's requirements and the requirements of ASME Section XI.

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e) Procurement Document Control

Procurement documents shall require suppliers to provide a Quality Assurance Program consistent with the applicable requirements of ASME Section III, NCA and this section. Documents for procurement of materials, items, and subcontracted services shall include requirements to the extent necessary to ensure compliance with the owner's requirements and IWA-4000 of ASME Section XI. To the extent necessary, procurement documents shall require suppliers to maintain a Quality Assurance Program consistent with the applicable requirements of the edition and addenda of the code of construction to which the items are constructed. Measures shall be established to ensure that all purchased material, items, and services conform to these requirements.

Revise to read: ASME
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f) Instructions, Procedures, and Drawings

Repair/replacement plans and any verification of acceptability (evaluations) shall be subject to review by Jurisdiction and Regulatory Authorities having jurisdiction at the plant site. Activities affecting quality shall be prescribed by documented instructions, procedures or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative and qualitative criteria for determining that activities affecting quality have been satisfactorily accomplished. The "NR" Certificate Holder shall maintain a written description of procedures, instructions, or drawings used by the organization for control of quality and examination requirements detailing the implementation of the Quality Assurance Program requirements. Copies of these procedures shall be readily available to the Authorized Nuclear Inspector and Authorized Nuclear Inservice Inspector, as applicable.

g) Document Control

The program shall include measures to control the issuance, use, and disposition of documents, such as specifications, instructions, procedures, and drawings, including changes thereto. These measures shall ensure that the latest applicable documents, including changes, are reviewed for adequacy and approved for release by authorized personnel and distributed for use at the location where the prescribed activity is performed.

Revise to read: ASME
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h) Control of Purchased Material, Items, and Services

Purchase of materials and small products shall meet the requirements specified in ASME Section XI, IWA 4142. Measures shall be established to ensure that purchased material, items, and services conform to the owner's requirements and applicable edition and addenda of the code of construction and ASME Section XI. These measures shall include identification for material traceability. Provisions shall be identified for source evaluation and objective evidence shall be provided evidencing quality standards for material examination upon receipt.

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i) Identification and Control of Items

- 1) Measures shall be established for identification and control of material and items, including partially fabricated assemblies. These measures shall ensure that identification is maintained and traceable, either on the material or component, or on records throughout the repair/replacement activity. These measures shall be designed to prevent the use of incorrect or defective items and those which have not received the required examinations, tests, or inspections.
- 2) Identification for traceability shall be applied using methods and materials that are legible and not detrimental to the component or system involved. Such identification shall be located in areas that will not interfere with the function or quality aspects of the item.
- 3) Certified Material Test Reports shall be identified as required by the applicable material specification in ASME Section II and shall satisfy any additional requirements specified in the original code of construction. The Certified Material Test Report or Certificate of Compliance need not be duplicated for submission with compliance documents when a record of compliance and satisfactory reviews

of the Certified Material Test Report and Certificate of Compliance is provided. Quality documents shall provide a record that the Certified Material Test Report and Certificate of Compliance have been received, reviewed, and found acceptable. When the “NR” Certificate Holder authorizes a subcontracted organization to perform examinations and tests in accordance with the original code of construction, the “NR” Certificate Holder shall certify compliance either on a Certified Material Test Report or Certificate of Compliance that the material satisfies the original code of construction requirements.

j) Control of Processes

- 1) The “NR” Certificate Holder shall operate under a controlled system such as process sheets, checklists, travelers, plans or equivalent procedures. Measures shall be established to ensure that processes such as welding, nondestructive examination, and heat treating are controlled in accordance with the rules of the applicable section of the ASME Code and are accomplished by qualified personnel using qualified procedures.
- 2) Process sheets, checklists, travelers, or equivalent documentation shall be prepared, including the document numbers and revisions to which the process conforms with space provided for reporting results of completion of specific operations at checkpoints of repair/replacement activities.

k) Examinations, Tests, and Inspections

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- 1) A repair/replacement plan shall be prepared in accordance with the Quality Assurance Program whenever repair/replacement activities are performed. As a minimum, the repair/replacement plan shall include the requirements specified in ASME Section XI, IWA-4150.
- 2) In-process and final examinations and tests shall be established to ensure conformance with specifications, drawings, instructions, and procedures which incorporate or reference the requirements and acceptance criteria contained in applicable design documents. Inspection, test and examination activities to verify the quality of work shall be performed by persons other than those who performed the activity being examined. Such persons shall not report directly to the immediate supervisors responsible for the work being examined.
- 3) Process sheets, travelers, or checklists shall be prepared, including the document numbers and revision to which the examination or test is to be performed, with space provided for recording results.
- 4) Mandatory hold/inspection points at which witnessing is required by the “NR” Certificate Holder’s representative or the Authorized Nuclear Inspector/Authorized Nuclear Inservice Inspector shall be indicated in the controlling documents. Work shall not proceed beyond mandatory hold/inspection points without the consent of the “NR” Certificate Holder’s representative or the Authorized Nuclear Inspector/Authorized Nuclear Inservice Inspector, as applicable.

l) Test Control

- 1) Testing shall be performed in accordance with the owner’s written test procedures or procedures acceptable to the owner, that incorporate or reference the requirements and acceptance criteria contained in applicable design documents.
- 2) Test procedures shall include provisions for ensuring that prerequisites for the given test have been met, that adequate instrumentation is available and used, and that necessary monitoring is performed. Prerequisites may include calibrated instrumentation, appropriate equipment, trained personnel, condition of test equipment, the item to be tested, suitable environmental conditions, and provisions for data acquisition.
- 3) Test results shall be documented and evaluated to ensure that test requirements have been satisfied.

m) Control of Measuring and Test Equipment

The "NR" Certificate Holder may utilize calibration and test activities performed by subcontractors when surveys and audits are performed. As an alternative to performing a survey and audit for procuring Laboratory Calibration and Test Services, the "NR" Certificate Holder as documented in their Quality Program may accept accreditation of an International Calibration and Test Laboratory Services by the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) provided this alternative method is described in the "NR" Certificate Holder's Quality Program and the following requirements are met:

- 1) The "NR" Certificate Holder shall review and document verification that the supplier of calibration or test services was accredited by an accredited body recognized by the ILAC MRA encompassing ISO/IEC-17025:2005 or 2017, "General Requirements for the Competence of Testing and Calibration Laboratories";
- 2) For procurement of calibration services, the published scope of accreditation for the calibration laboratory covers the needed measurement parameters, ranges and uncertainties;
- 3) For procurement of testing services, the published scope of accreditation for the test laboratory covers the needed testing services including test methodology and tolerances/uncertainty;
- 4) The "NR" Certificate Holder's purchase documents shall include:
 - a. Service provided shall be in accordance with their accredited ISO/IEC-17025:2005 or 2017 program and scope of accreditation;
 - b. As-found calibration data shall be reported in the certificate of calibration when items are found to be out-of-calibration;
 - c. Standards used to perform calibration shall be identified in the certificate of calibration;
 - d. Notification of any condition that adversely impacts the laboratories ability to maintain the scope of accreditation;
 - e. Any additional technical and/or quality requirements, as necessary, which may include tolerances, accuracies, ranges, and standards; and
 - f. Service suppliers shall not subcontract services to any other supplier.
- 5) The "NR" Certificate Holder shall upon receipt inspection, validate that the laboratory documentation certifies that:
 - a. Services provided by the laboratory has been performed in accordance with their ISO/IEC-17025:2005 or 2017 program and performed within their scope; and
 - b. Purchase order requirements have been met.

n) Handling, Storage, and Shipping

Measures and controls shall be established to maintain quality requirements for handling, storage, and shipping of parts, materials, items, and components.

o) Quality Assurance Records

Documentation, reports and records shall be in accordance with ~~ASME~~ Section XI, IWA-6000.

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- 1) The owner is responsible for designating records to be maintained. Measures shall be established for the "NR" Certificate Holder to maintain these records [see NBIC Part 3, 1.6.7.2.o) 2)] required for Quality Assurance of repair/replacement activities. These shall include documents such as records

of materials, manufacturing, examination, and test data taken before and during repair/replacement activity. Procedures, specifications, and drawings used shall be fully identified by pertinent material or item identification numbers, revision numbers, and issue dates. The records shall also include related data such as personnel qualification, procedures, equipment, and related repairs. The "NR" Certificate Holder shall take such steps as may be required to provide suitable protection from deterioration and damage for records while in his care. Also, it is required that the "NR" Certificate Holder have a system for correction or amending records that satisfies the owner's requirements. These records may be either the original or a reproduced, legible copy and shall be transferred to the owner upon request.

- 2) Records to be maintained as required in NBIC Part 3, 1.6.7.2 o) 1) above shall include the following, as applicable:
 - a. An index that details the location and individual responsible for maintaining the records;
 - b. Manufacturer's Data Reports, properly executed, for each replacement component, part, appurtenance, piping system, and piping assembly, when required by the design specification or the owner;
 - c. The required as-constructed drawings certified as to correctness;
 - d. Copies of applicable Certified Material Test Reports and Certificates of Compliance;
 - e. As-built sketch(es) including tabulations of materials repair/replacement procedures, and instructions to achieve compliance with ASME Section XI;
 - f. Nondestructive examination reports, including results of examinations, shall identify the name and certification level of personnel interpreting the examination results. Final radiographs shall be included where radiography has been performed. Radiographs may be microfilmed or digitally reproduced in accordance with the requirements listed in ASME Section V, Article 2, Mandatory Appendix VI. The accuracy of the reproduction process shall be verified and monitored for legibility, storage, retrievability and reproduction quality;
 - g. Records of heat treatments may be either the heat treatment chart or a tabulation of heat treatment time and temperature data certified by the "NR" Certificate Holder. Heat treatments performed by the material manufacturer to satisfy requirements of the material specifications may be reported on the Certified Material Test Report; and
 - h. Nonconformance reports shall satisfy IWA-4000 of ASME Section XI and shall be reconciled by the owner prior to certification of the Form NR-1 or NVR-1, as applicable.
- 3) After a repair/replacement activity, all records including audit reports required to verify compliance with the applicable engineering documents and the "NR" Certificate Holder's Quality Assurance Program, shall be maintained at a place mutually agreed upon by the owner and the "NR" Certificate Holder. The "NR" Certificate Holder shall maintain records and reports for a period of five years after completion of the repair/replacement activity.
- 4) When the "NR" Certificate Holder is the owner, designated records and reports received by the owner, shall be filed and maintained in a manner to allow access by the Authorized Nuclear Inservice Inspector. Suitable protection from deterioration and damage shall be provided by the owner. These records and reports shall be retained as specified in the owners QAP for the lifetime of the component or system.
- 5) The original of the completed Form NR-1 or Form NVR-1, as applicable, shall be registered with the National Board and, if required, a copy forwarded to the Jurisdiction where the nuclear power plant is located. A log shall be maintained in accordance with NBIC Part 3, 5.6.

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p) Corrective Action

- 1) Measures shall be established to ensure that conditions adverse to quality such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and other nonconformances are promptly identified, controlled and corrected.
- 2) In the case of significant conditions adverse to quality, the measures shall also ensure that the cause of these conditions be determined and corrected to preclude repetition. The identification of significant conditions adverse to quality, the cause, condition, and the corrective action taken shall be documented and reported to the appropriate levels of management.
- 3) Corrective action requirements shall also extend to the performance of subcontractors' activities.

q) Inspection or Test Status (not to include operating status)

Measures shall be established to indicate examination and test status of parts, items, or components during the repair/replacement activity. The system used shall provide positive identification of the part, item, or component by means of stamps, labels, routing cards, or other acceptable methods. The system shall include any procedures or instructions necessary to achieve compliance. Also, measures shall be provided for the identification of acceptable and unacceptable items. They shall also include procedures for control of status indicators, including the authority for application and removal of status indicators.

r) Nonconforming Materials or Items

- 1) Measures shall be established to control materials or items that do not conform to specified requirements to prevent their inadvertent use, including measures to identify and control the proper installation of items and to preclude nonconformance with the requirements of these rules. These measures shall include procedures for identification, documentation, segregation, and disposition. Nonconforming items shall be reviewed for acceptance, rejection, or repair in accordance with documented procedures. The responsibility and authority for the disposition of nonconforming items shall be defined. Repaired/replaced or altered items shall be re-examined in accordance with the applicable procedures.
- 2) Measures that control further processing of a nonconforming or defective item, pending a decision on its disposition, shall be established and maintained. Ultimate disposition of nonconforming items shall be documented.

s) Audits

A comprehensive system of planned and periodic audits of the "NR" Certificate Holder's Quality Assurance Program shall be performed. Audit frequency shall be specified in the organization's Quality Assurance Manual. Audits shall be conducted at least annually (within 12 months) to verify compliance with Quality Assurance Program requirements, performance criteria and to determine the effectiveness of the Quality Assurance Program. When no code work has been performed, the required annual audit need only include those areas of responsibility required to be continually maintained such as training, audits, organizational structure, Quality Assurance Program revisions, etc. The Quality Assurance Manual shall as a minimum describe the following:

- 1) Audits shall be performed in accordance with written procedures or checklists by qualified audit personnel not having direct responsibility in areas being audited;
- 2) Audit personnel shall be qualified in accordance with the current requirements of NQA-1;
- 3) Audit results shall be documented and reviewed by responsible management for adequacy and effectiveness of the quality assurance program;
- 4) Requirements for follow-up actions for any deficiencies noted during the audit;

- 5) Audit records and applicable documentation shall be made available to the Authorized Nuclear Inspection Agency for review; and
- 6) Audit records shall include as a minimum:
 - a. written procedures;
 - b. checklists;
 - c. reports;
 - d. written replies; and
 - e. completion of corrective actions.

Performance of Authorized Inspection Agency audits required by ASME QAI-1 and NB-263, RCI-1 shall be addressed in the Quality Assurance Manual.

t) Authorized Nuclear Inspector

Measures shall be taken to reference the commissioned rules for National Board Authorized Nuclear Inspector, in accordance with NB-263, RCI-1 *Rules for Commissioned Inspectors*. The “NR” Certificate Holder shall ensure that the latest documents including the Quality Assurance Manual, procedures and instructions are made available to the Authorized Nuclear Inspector. The Authorized Nuclear Inspector shall be consulted prior to the issuance of a repair/replacement plan by the “NR” Certificate Holder in order that the Authorized Nuclear Inspector may select any in process inspection or hold points when performing repair/replacement activities. The “NR” Certificate Holder shall keep the Authorized Nuclear Inspector informed of progress of the repair/replacement activity so that inspections may be performed. The Authorized Nuclear Inspector shall not sign Form NR-1 or Form NVR-1, as applicable, unless satisfied that all work carried out is in accordance with this section. The Authorized Nuclear Inspector and Authorized Nuclear Inspector Supervisor shall have access to areas where work is being performed including subcontractors facilities in order to perform their required duties. The ANI shall be involved in dispositions and verification for nonconformances and corrective actions involving quality or code requirements.

u) Exhibits

Forms and exhibits referenced in the Quality Assurance Manual shall be explained in the text and included as part of the referencing document or as an appendix to the Quality Assurance Manual. Forms shall be controlled and identified to show the latest approved revision, name, and other corresponding references as stated in the Quality Assurance Manual.

1.6.8 QUALITY ASSURANCE PROGRAM REQUIREMENTS FOR CATEGORY 3 ACTIVITIES

1.6.8.1 SCOPE

Organizations requesting a Category 3 “NR” *Certificate of Authorization* may elect to follow the requirements specified in ASME NQA-1 Part 1 or follow specific Quality Assurance Program requirements outlined in other specified standards as required by the owner, Regulatory Authority or Jurisdiction. Organizations shall specify in the QAM what QAP requirements are followed. When standards other than ASME NQA-1 are followed, the organization shall have available a copy of that standard for review by the NB Survey Team and the ANIA, as applicable. Each organization shall, as a minimum, include in their written QAM the specified elements listed in Category 1 and/or 2 (1.6.6, 1.6.7) QAP requirements. Additional requirements, as specified within NBIC Part 3, 1.6.8 and 1.6.9 shall be included within the QAP. Also, limitations or additions to ASME NQA-1, as specified for Category 1 or 2 may be incorporated and referenced within the QAM.

(21) 1.6.8.2 QUALITY PROGRAM ELEMENTS**a) Organization**

The authority and responsibility for individuals involved in activities affecting quality shall be clearly established and documented throughout the Quality Assurance Program and identified on a functional organizational chart contained within the QA Manual.

b) Statement of Policy and Authority shall:

- 1) identify the titles of individuals who have the authority and responsibility charged with ensuring the quality program is implemented as described;
- 2) confirm their freedom in the organization to identify quality problems and to initiate, recommend and provide solutions;
- 3) include a statement that if there is a disagreement in the implementation of the quality assurance program, the matter is to be referred for resolution to a higher authority and shall be resolved in a manner that will not conflict with code, jurisdiction/regulatory authority or quality program requirements;
- 4) include a statement of the full support of management; and
- 5) be dated and signed by a senior management official within the organization.

c) QAP

The quality assurance program shall be documented by written policies, procedures and instructions. It shall account for special controls, processes, test equipment, tools and skills to obtain quality and for verification of quality by inspections and tests. Indoctrination, training and maintaining proficiency of personnel effecting quality shall be described. The status, adequacy and effectiveness of the QAP shall be regularly reviewed by management. The scope shall be included within the written QAM. The "NR" Certificate Holder shall make a current controlled copy of the Quality Assurance Manual available to the Authorized Nuclear Inspector and Authorized Nuclear Inspector Supervisor. The "NR" Certificate Holder shall address in their QAM the requirements for interfacing with the owner specified in 1.6.9 of this section. Specified controls including responsibilities for personnel shall be described in the quality assurance program.

d) Design Control

Established measures to assure applicable quality standards and regulatory requirements are accurately specified and translated into design documents. Any deviations shall be identified and controlled. Control measures (such as review, approval, release, distribution and revisions) for suitability of materials, parts, equipment, procedures, instructions and processes, shall be performed to ensure adherence to specified design basis requirements. Qualifications, responsibilities and certifications of design personnel shall be clearly defined within the quality assurance program.

e) Procurement Document Control

Documents for procurement of material, equipment and services shall ensure regulatory requirements, design bases and other quality requirements are included or referenced. Procurement documents shall require contractors or subcontractors provide a Quality Assurance Program consistent with the provisions specified herein. Controls necessary to ensure materials, equipment, and services meet specified design criteria shall be clearly described within the quality assurance program.

f) Instructions, Procedures, and Drawings

Activities affecting quality shall be accomplished in accordance with prescribed instructions, procedures or drawings and shall include appropriate quantitative or qualitative acceptance criteria to determine activities are satisfactorily accomplished.

g) Document Control

Shall define measures to control the preparation, issuance, use, review approval, revisions and distribution of all documents, including procedures, instructions and drawings related to quality. Responsibilities shall be described within the quality program.

h) Control of Purchased, Materials, Items and Services

Purchased material, items and services shall conform to the procurement documents. Measures shall be established for source evaluation and selection, objective evidence of quality, inspections at the source and examination of products upon delivery. Effectiveness of quality of suppliers shall be assessed by the applicant or designee at specified intervals. Documented evidence shall be performed and made available to assure materials and services conform to procurement documents, quality procedures and instructions.

i) Identification and Control of Items

Specified controls shall ensure only correct and acceptable items, parts and components are used and installed and traceable to required documents such as certified material test reports, certificates of conformance, or data reports. These controls shall include traceability on the items or on records traceable to the items during fabrication and final acceptance and test.

j) Control of Processes

Documents used to control processes shall be prepared, including the document numbers and revision to which the process conforms and shall include space for providing reporting of results of specific operations at checkpoints of repair/replacement activity, and provide spaces for signatures, initials, stamps and dates for activities performed by the Certificate Holders' representative and the Authorized Nuclear Inspector. Special processes including welding, nondestructive examinations, heat treating, and bending are performed using qualified and approved procedures and qualified personnel in accordance with applicable codes, standards and other specified criteria.

k) Examinations, Tests, and Inspections

A repair / replacement plan, developed in accordance with Table 1.6.9, shall address all required information for performing examinations, tests and inspections including but not limited to:

- 1) Establishing hold points;
- 2) Identifying procedures, methods, acceptance criteria;
- 3) Defects identified, removal methods, welding, brazing, fusing, and material requirements, reference points used for identification; and
- 4) Evaluations of results

Examinations, tests and inspections shall be performed using trained and qualified personnel. Personnel records for qualification and training shall be available for review.

l) Test Control

Tests shall be performed using written procedures identifying prerequisites, acceptance limits, calibration, equipment, personnel qualifications, environmental conditions, and required documentation.

Personnel responsibilities shall be described for performance, acceptance/inspection and documenting results.

m) Control of Measuring and Test Equipment

The “NR” Certificate Holder may utilize calibration and test activities performed by subcontractors when surveys and audits are performed. As an alternative to performing a survey and audit for procuring Laboratory Calibration and Test Services, the “NR” Certificate Holder as documented in their Quality Program may accept accreditation of an International Calibration and Test Laboratory Services by the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) provided this alternative method is described in the “NR” Certificate Holder’s Quality Program and the following requirements are met:

- 1) The “NR” Certificate Holder shall review and document verification that the supplier of calibration or test services was accredited by an accredited body recognized by the ILAC MRA encompassing ISO/IEC-17025:2005 or 2017, “General Requirements for the Competence of Testing and Calibration Laboratories”;
- 2) For procurement of calibration services, the published scope of accreditation for the calibration laboratory covers the needed measurement parameters, ranges and uncertainties;
- 3) For procurement of testing services, the published scope of accreditation for the test laboratory covers the needed testing services including test methodology and tolerances/uncertainty;
- 4) The “NR” Certificate Holder’s purchase documents shall include:
 - a. Service provided shall be in accordance with their accredited ISO/IEC-17025:2005 or 2017 program and scope of accreditation;
 - b. As-found calibration data shall be reported in the certificate of calibration when items are found to be out-of-calibration;
 - c. Standards used to perform calibration shall be identified in the certificate of calibration;
 - d. Notification of any condition that adversely impacts the laboratories ability to maintain the scope of accreditation;
 - e. Any additional technical and/or quality requirements, as necessary, which may include tolerances, accuracies, ranges, and standards; and
 - f. Service suppliers shall not subcontract services to any other supplier.
- 5) The “NR” Certificate Holder shall upon receipt inspection, validate that the laboratory documentation certifies that:
 - a. Services provided by the laboratory has been performed in accordance with their ISO/IEC-17025:2005 or 2017 program and performed within their scope; and
 - b. Purchase order requirements have been met.

n) Handling, Storage, and Shipping

Processes or procedures shall be established to prevent damage, deterioration or misuse of material, items or components used and stored. Controls for handling, shipping, storage, cleanliness and preservation shall be specified in the quality program.

o) Records

- 1) All quality related records shall be classified, identified, verified, maintained, distributed retrievable, and accessible. When the “NR” Certificate Holder is the owner, designated records and reports

received by the owner, shall be filed and maintained in a manner to allow access by the Authorized Nuclear Inservice Inspector (ANII). Suitable protection from deterioration and damage shall be provided by the owner. These records and reports shall be retained as specified in the owner's QAP for the lifetime of the component or system. Records to support evidence of activities affecting quality shall include as applicable:

- a. Inspections and acceptance criteria/results;
- b. Tests performed and supporting reports;
- c. Procedures/instructions;
- d. Qualification of personnel, procedures, and equipment;
- e. Types of observations and results;
- f. Audits;
- g. Nonconformances; and
- h. Corrective actions.

- 2) The original of the completed Form NR-1 or Form NVR-1, as applicable, shall be registered with the National Board and, if required, a copy forwarded to the Jurisdiction where the nuclear power plant is located. A log shall be maintained in accordance with NBIC Part 3, 5.6.

p) Corrective Action

- 1) Measures shall be established to ensure that conditions adverse to quality such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and other nonconformances are promptly identified and corrected.
- 2) In the case of significant conditions adverse to quality, the measures shall also ensure that the cause of these conditions be determined and corrected to preclude repetition. The identification of significant conditions adverse to quality, the cause, condition, and the corrective action taken shall be documented and reported to the appropriate levels of management.
- 3) Corrective action requirements shall also extend to the performance of subcontractors' activities.

q) Inspection or Test Status

Measures shall be established to indicate inspection and test status of parts, items or components during repair/replacement activity. Measures shall include identification, procedures, control indicators (acceptable, unacceptable) and responsibility of personnel.

r) Nonconforming Material or Items

Measures to control material or items, nonconforming to specified criteria shall be established. Measures shall include identifying, controlling, documenting, reviewing, verifying, dispositioning and segregation when practical.

s) Audits

A comprehensive system of planned and periodic audits of the "NR" Certificate Holder's Quality Assurance Program shall be performed. Audit frequency shall be specified in the organization's Quality Assurance Manual. Audits shall be conducted at least annually (within 12 months) to verify compliance with Quality Assurance Program requirements, performance criteria and to determine the effectiveness of the Quality Assurance Program. When no code work has been performed, the required annual audit need only include those areas of responsibility required to be continually maintained such as training,

audits, organizational structure, Quality Assurance Program revisions, etc. The Quality Assurance Manual shall as a minimum describe the following:

- 1) Audits shall be performed in accordance with written procedures or checklists by qualified audit personnel not having direct responsibility in areas being audited;
- 2) Audit personnel shall be qualified in accordance with recognized standards, such as NQA-1;
- 3) Audit results shall be documented and reviewed by responsible management for adequacy and effectiveness of the quality assurance program;
- 4) Requirements for follow-up actions for any deficiencies noted during the audit;
- 5) Audit records and applicable documentation shall be made available to the Authorized Nuclear Inspection Agency for review;
- 6) Audit records shall include as a minimum:
 - a. written procedures;
 - b. checklists;
 - c. reports;
 - d. written replies; and
 - e. completion of corrective actions.

Performance of Authorized Inspection Agency audits required by ASME QAI-1 and NB-263, RCI-1 shall be addressed in the Quality Assurance Manual.

t) Authorized Nuclear Inspector

Qualifications and duties shall be as specified in ASME QAI-1 and NB-263, RCI-1 for the Authorized Inspection Agencies, Authorized Nuclear Inspector and the Authorized Nuclear Inspector Supervisor. Additional requirements are specified in NBIC Part 3, 1.6.6.2 s), 1.6.7.2 s), and 1.6.9.

u) Exhibits

Quality related forms and exhibits described in the Quality Assurance Program shall be identified, controlled and where applicable included as a reference document within the QAM or referenced procedures.

1.6.9 INTERFACE WITH THE OWNER'S REPAIR/REPLACEMENT PROGRAM (FOR CATEGORIES 1, 2, AND 3 AS APPLICABLE)

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owner's repair/replacement program shall meet the following:

- a) The "NR" Certificate Holder's repair/replacement plan (see Table 1.6.9) shall be subject to the acceptance of the owner and the owner's Authorized Nuclear Inservice Inspector (ANII) and shall be subject to review by the Jurisdiction and Regulatory Authorities having jurisdiction at the plant site.
- b) Repair/Replacement activities of nuclear components shall meet the requirements of ASME Section III, ASME Section XI, and/or other applicable standard, and the owner's requirements, and shall be subject to verification by the Jurisdiction and Regulatory Authorities having jurisdiction at the plant site.
- c) Documentation of the repair/replacement activities of nuclear components shall be recorded on the Report of Repair/Replacement Activities of Nuclear Components and Systems for Nuclear Facilities, Form NR-1, or Report of Repair/Replacement Activities for Nuclear Pressure Relief Devices, Form NVR-1, in accordance with the NBIC Part 3, Section 5. The completed forms shall be signed by a

representative of the “NR” Certificate Holder and the Authorized Nuclear Inspector when the repair/replacement activity meets the requirements of this section. For repair/replacement activities that involve design changes, Form NR-1, or Form NVR-1, as applicable, shall indicate the organization responsible for the design or design reconciliation in accordance with the owner’s requirements.

- d) The “NR” Certificate Holder shall provide a copy of the signed Form NR-1 or Form NVR-1, as applicable, to the owner, the Enforcement, and the Regulatory Authority if required, and the Authorized Nuclear Inspection Agency. The original Form NR-1 or Form NVR-1, as applicable, shall be registered with the National Board by the “NR” Certificate Holder. A NB registration log shall be maintained by the “NR” Certificate Holder. See NBIC Part 3, Section 5.5 and 5.6.
- e) The “NR” Certificate Holder shall provide a nameplate/stamping for repair/replacement activities for each nuclear component unless otherwise specified by the owner’s Quality Assurance Program. The required information and format shall be as shown in NBIC Part 3, Section 5.

SUPPLEMENT 6**REPAIR, ALTERATION, AND MODIFICATION OF DOT TRANSPORT (CARGO) TANKS****S6.1 SCOPE**

This supplement provides requirements and guidelines for repairs, alterations, or modifications to DOT Transport Tanks used for the transportation of dangerous goods via highway, rail, air, or water.

S6.2 DEFINITIONS

The definitions specified in NBIC Part 3, Section 9, *Glossary*, shall be used in conjunction with those specified in NBIC Part 2, S6.17. Where conflicts between definitions exist, those identified in NBIC Part 2, S6.17 shall take precedence.

S6.3 CONSTRUCTION STANDARDS

When the standard governing the original construction is the ASME Code or other regulations of the Competent Authority, repairs, alterations, or modifications shall conform, insofar as possible, to the edition of the construction standard or specification most applicable to the work. Where this is not possible or practical practicable, it is permissible to use other codes, standards or specifications, including the ASME Code provided the "R" Certificate Holder has the concurrence of the Inspector and, if required, the Competent Authority.

S6.4 ACCREDITATION AND REGISTRATION

Organizations performing repairs, alterations, or modifications shall be accredited in accordance with the National Board "R" Accreditation Program. In addition repair organizations performing repairs, alterations, or modifications to transport tanks shall be registered with DOT as required by 49 CFR Part 180.

S6.5 AUTHORIZATION

The Inspector's authorization to perform a repair, alteration, or modification shall be obtained prior to initiation of the work to be performed on a transport tank. Additional requirements are specified in NBIC Part 3, 1.3.1 and 1.3.2.

S6.6 INSPECTION

Inspection and certification shall be made by an Inspector holding an appropriate National Board Commission as required by NBIC Part 3, 1.3.

S6.7 MODIFICATIONS

All modifications, as defined in NBIC Part 2, Supplement 6, to the pressure-retaining item shall meet the requirements of NBIC Part 3 for alterations.

S6.8 DRAWINGS AND CALCULATIONS

- a) Design requirements for repairs, alterations and modifications shall comply with the requirements of NBIC Part 3, 3.2.4.
- b) As appropriate, drawings or instructions shall be prepared to describe the repair, alteration, or modification. Drawings shall include sufficient information to satisfactorily perform the activity.

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c) The design of alterations and modifications shall be completed by an organization experienced in the design portion of the standard used for the construction of the item and certified by a Design Certifying Engineer as defined in NBIC Part 2, S6.17. Design documents shall be completed prior to the start of any physical work and be available for review by the Inspector accepting the design.

S6.95 MATERIALS

The materials used in making repairs, alterations, or modifications shall conform to the original code of construction including the material specification requirements. Carbon or alloy steel having a carbon ~~con-~~content of more than 0.35% (0.30% for ton tanks) shall not be welded unless permitted by the original code of construction. The "R" Certificate Holder is responsible for verifying the identification of existing materials from original data, drawings, or unit records and identification of the material to be installed. Materials that have previously been in service, as described in Part 3, 3.2.1 c), are not permitted for alterations or modifications of DOT Transport Tanks per 49 CFR Part 180. Additional material requirements are provided in NBIC Part 3, Section 3.

S6.6-10 REPLACEMENT PARTS

Replacement parts to be used in repairs, alterations, and modifications of DOT Transport Tanks shall comply with the requirements provided in NBIC Part 3, 3.2.2.

- a) Replacement parts that will be subject to internal or external pressure that consist of new material which may be formed to the required shape by spinning, forging, die forming, and on which no fabrication welding is performed shall be supplied as material. Such parts shall be marked with the material and part identification and the name or trademark of the parts manufacturer. In lieu of full identification marking on the material or part, the part manufacturer may use a coded marking system traceable to the original marking. Such markings shall be considered as the part manufacturer's certification that the part complies with the original code of construction. Examples include seamless or welded tube or pipe, forged nozzles, heads or subassemblies attached mechanically.
- b) Replacement parts that will be subject to internal or external pressure, that are preassembled by attachment welds, shall have the welding performed in accordance with the original code of construction. This certificate shall be supplied in the form of a bill of material or drawings with statement of certification.
- c) Replacement parts subject to internal or external pressure fabricated by welding that require shop inspection by an Authorized Inspector shall be fabricated by an organization having an appropriate ASME Certificate of Authorization. The item shall be inspected and stamped as required by the applicable section of the ASME Code and DOT specification requirements. A completed ASME Manufacturer's Partial Data Report shall be supplied by the manufacturer.
- d) When the original code of construction is other than ASME, replacement parts subject to internal or external pressure fabricated by welding shall be manufactured by an organization certified as required by the original code of construction. The item shall be inspected and stamped as required by the original code of construction. Certification as required by the original code of construction shall be supplied with the item. When this is not possible or practicable the organization fabricating the part may have a National Board Certificate of Authorization. Replacement parts fabricated by an "R" stamp holder shall be documented on Form R-3 and the "R" Stamp applied as described in NBIC Part 3, S6.15.

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S6.7 AUTHORIZATION

The Inspector's written authorization to perform a repair, alteration, or modification shall be obtained prior to initiation of the work to be performed on a transport tank. Additional requirements are specified in NBIC Part 3, 1.3.1 and 1.3.2.

S6.8 INSPECTION

Inspection and certification shall be made by an Inspector holding an appropriate National Board Commission as required by NBIC Part 3, 1.3 and shall be a Registered Inspector meeting the requirements of the Competent Authority.

S6.8.1 INSPECTOR DUTIES FOR REPAIRS, ALTERATIONS, AND MODIFICATIONS

- a) Inspectors performing repair, alteration, or modification inspections under the requirements of this supplement shall satisfy the requirements of S6.8.1 to be authorized to sign the Form R-1, *Repairs* and Form R-2, *Alterations*.
- b) For repairs, alterations, and modifications of transport tanks, the duties of the Registered Inspector performing inspections are detailed in Part 2, S6.10 through S6.15, as required by the Competent Authority.
- c) The Registered Inspector shall meet the rules of NB-263, RCI-1, Rules for Commissioned Inspectors. Additional duties are summarized below:
 - 1) Verify the organization performing the repair, alteration or modification activity is properly accredited and in possession of a current valid *Certificate of Authorization* to apply the "R" Stamp issued by the National Board and is working to an accepted Quality Control System;
 - 2) Verify that the design, if required, for the modification of the vessel is approved by a Design-Certifying Engineer, or Designated Approval Agency or other applicable individual;
 - 3) Verify the materials to be used to make the repair, alteration, or modification are approved for use and comply with applicable code requirements;
 - 4) Verify the welding procedures and welders or welding operators are properly qualified;
 - 5) Verify that all heat treatments, if required, including PWHT have been performed in accordance with the applicable standards and that the results are acceptable;
 - 6) Verify that all NDE, impact tests, and other tests have been performed when required, and that they are acceptable;
 - 7) Make a visual inspection of the work performed to confirm there are no visible defects or deviations from code requirements;
 - 8) Perform external and internal visual inspections, if the vessel is equipped with a manway, and witness the hydrostatic or pneumatic pressure test and/or leak tightness test when they are required;
 - 9) Verify the correct nameplate is properly attached to the vessel and that the current test and inspection markings are properly attached and displayed on the proper vessel;
 - 10) Sign the Form R-1 and, as appropriate, form R-2 when work is completed.

S6.9-11 WELDING

- a) Welding, including procedure specification qualification, performance qualification, qualification records, qualified personnel identification, continuity of qualified personnel, and process continuity

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records shall be performed in accordance with the requirements of the original code of construction used for the fabrication of the pressure vessel retaining item and Part 3, Section 2.

a)b) For hydrogen control when low alloy steel filler metals are used, the filler metal classification shall include an H4 supplemental diffusible hydrogen designator (maximum 4 ml [H₂]/100 g deposited metal) for each of the following welding processes:

- 1) electrodes for shielded metal arc welding (SMAW) conforming to SFA-5.5;
- 2) electrodes and fluxes for submerged arc welding (SAW) conforming to SFA-5.26;
- 3) electrodes and rods for gas shielded metal arc welding (GMAW) conforming to SFA-5.28;
- 4) electrodes for flux-cored arc welding (FCAW) conforming to SFA 5.29.

c) Practices used for controlling storage and exposure of filler metals shall be those developed by the "R" Certificate Holder or those recommended by the filler metal manufacturer.

b)

S6.9.1 — WELDING PROCEDURE SPECIFICATION

~~Welding shall be performed in accordance with a Welding Procedure Specification (WPS) qualified in accordance with the original code of construction. When this is not possible or practicable, the WPS may be qualified in accordance with ASME Section IX.~~

S6.9.2 — STANDARD WELDING PROCEDURE SPECIFICATIONS

~~A "R" Certificate Holder may use one or more applicable Standard Welding Procedure Specifications shown in NBIC Part 3, 2.3 without supporting Procedure Qualification Records (PQRs) since SWPS are pre-qualified and the PQR will not be supplied.~~

S6.9.3 — PERFORMANCE QUALIFICATION

~~Welders or welding operators shall be qualified for the welding processes that are used. Such qualification shall be in accordance with the requirements of the original code of construction or ASME Section IX. Use of Standard Welding Procedures Specification shown in NBIC Part 3.2.3 is permitted for performance qualification testing.~~

S6.9.4 — WELDING RECORDS

~~The "R" Certificate Holder shall maintain a record of the results obtained in welding procedure qualification, except for those qualifications for which the provisions of NBIC Part 3, S6.8.2 are used and of the results obtained in welding performance qualifications. These records shall be certified by the "R" Certificate Holder and shall be available to the inspector.~~

S6.9.5 — WELDERS' IDENTIFICATION

~~The "R" Certificate Holder shall establish a system for the assignment of a unique identification mark to each welder/welding operator qualified in accordance with the requirements of the NBIC. The "R" Certificate Holder shall also establish a written procedure whereby all welded joints can be identified as to the welder or welding operator who made them. This procedure shall use one or more of the following methods and be acceptable to the Inspector. The welder's or welding operator's identification mark may be stamped (low stress stamp) adjacent to all welded joints made by the individual or, in lieu of stamping, the "R" Certificate Holder may keep a record of the welded joints and the welders or welding operators used in making the joint.~~

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S6.9.6 WELDERS' CONTINUITY

The performance qualification of a welder or welding operator shall be affected when one of the following conditions occurs:

- a) When the welder or welding operator has not welded using a specific process during a period of six months or more, their qualifications for that process shall expire;
- b) When there is specific reason to question their ability to make welds that meet the specification, the qualification which supports the welding that is being performed shall be revoked. All other qualifications not questioned remain in effect.

S6.40-12 HEAT TREATMENT

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S6.4012.1 PREHEATING

Preheating may be employed during welding use of a process to assist in completion of the welded joint. Preheating shall comply with the requirements in NBIC Part 3, 2.5.1. (see NBIC Part 3, 2.5.1). The need for and the temperature of preheat are dependent on a number of factors such as chemical analysis, degree of restraint of the items being joined, material thickness, and mechanical properties of the base metals being joined. The Welding Procedure Specification for the material being welded shall specify the preheat temperature requirements.

S6.4012.2 POSTWELD HEAT TREATMENT (PWHT)

Postweld heat treatment may used in repairs, alterations, and modifications of DOT Transport Tanks shall comply with the requirements provided in NBIC Part 3, 2.5.2. be performed as required by the original code of construction in accordance with a written procedure. The procedure shall contain the parameters for postweld heat treatment. Local PWHT that is not specified by the original code of construction may be performed in accordance with an Alternative Postweld Heat Treatment Method described in NBIC Part 3, 2.5.2 with acceptance by the Inspector and required by the Competent Authority.

S6.4012.3 ALTERNATIVES TO POSTWELD HEAT TREATMENT

- a) Under certain conditions, postweld heat treatment in accordance with the original code of construction may be inadvisable or impractical. In such instances, alternative methods of postweld heat treatment or special welding methods in accordance with NBIC Part 3, 2.5.3, and acceptable to the Inspector and Competent Authority may be used.
- b) When the standard governing the original construction is the Code of Federal regulation for DOT/MC 331 cargo tanks for propane, butane, anhydrous ammonia, and other DOT permitted commodities, and the tanks are made to the ASME Code, Section VIII, Division 1, Part UHT, repairs, alterations, or modifications shall conform insofar as possible, to the edition of the construction standard or specification most applicable to the work. Where this is not possible or practicable, it is permissible to use other codes, standards, or specifications provided the "R" Certificate Holder has the concurrence of the DOT. Shells and heads of MC 331 cargo tanks were made from quenched and tempered alloy steel plate, SA517, Grade E (originally Code Case 1298) and Grade F (originally Code Case 1204) prior to 1994.

- c) The 1994 ASME Code Addenda revised UHT-5(b) to permit the joining of UHT materials to UCS or UHA materials in head and shell sections. Propane, butane, and anhydrous ammonia are the most common transported commodities and the shipper is required by DOT to comply with certain composition limitations. Propane and butane transported must have sufficiently low hydrogen sulfide content so as not to exceed the limitations for Classification One of the ASTM D1838-74 copper strip test, and the anhydrous ammonia transported must be inhibited with a minimum water content of 0.2% by weight. In addition, such cargo tanks made for propane, butane, and anhydrous ammonia service must be postweld heat treated, unless specifically exempted by a DOT special permit that exempts PWHT.

S6.13 REPAIRS OF DEFECTS

- a) Before a repair is made to a defect in a welded joint or base metal, care should be taken to investigate its cause and to determine its extent and likelihood of recurrence. This information shall be made available to the Inspector.
- b) For MC 330 and MC 331 transport tanks, when a repair is made to defects revealed by the wet fluorescent magnetic particle examination, including those repaired by grinding, the affected area of the cargo tank must again be examined by the wet fluorescent magnetic particle method after hydrostatic testing to assure that all defects have been removed.

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S6.14-14 NONDESTRUCTIVE EXAMINATION

- a) The nondestructive examination (NDE) requirements, including qualification of NDE personnel shall comply with the requirements in NBIC Part 3, 4.2, including technique, extent of coverage, procedures, personnel qualification, and acceptance criteria, shall be in accordance with the original code of construction used for the pressure vessel, and repairs, alterations, and modifications shall be subjected to the same nondestructive examination requirements as the original welds. Where this is not possible or practicable, alternative NDE methods acceptable to the Inspector and the Competent Authority may be used on a case-by-case basis.
- b) NOE personnel shall be qualified and certified in accordance with the requirements of the original code of construction. When this is not possible or practicable, NDE personnel may be qualified and certified in accordance with their employer's written practice. ASNT SNT-TC-1A, Recommended Practice for Nondestructive Testing Personnel Qualification and Certification (2006 Edition), or ANSI/ASNT CP-189, Standard for Qualification and Certification of Nondestructive Testing Personnel (2006 Edition), shall be used as a guideline for employers to establish their written practice. The ASNT Central Certification Program (ACCP) may be used to fulfill the examination and demonstration requirements of the employer's written practice. Provisions for training, experience, qualification and certification of NDE personnel shall be described in the "R" Certificate Holder's written quality system.

S6.12 COATINGS AND LININGS

When coatings or linings are to be inspected, such inspections shall be done in accordance with the Structural Steel Painting Council, SSPC publication, No. 91-12, Coating and Lining Inspection Manual.

S6.153 MEASUREMENT, EXAMINATION, AND TEST EQUIPMENT

The calibration of pressure gages, measurement, examination, and test equipment, and documentation of calibration shall be performed, as required, by the applicable standard used for construction. This system shall be documented.

S6.16 PRESSURE TEST

The following requirements shall apply to all repairs, alterations, or modifications to DOT Transport Tank pressure-retaining items:

- a) The integrity of repairs and replacement parts used in repairs, alterations, or modifications shall be verified by a pressure test;
- b) The "R" Certificate Holder is responsible for all activities relating to the pressure test of repairs, alterations, or modifications;

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S6.16.1 PRESSURE TEST METHODS

The integrity of repairs, alterations and modifications of DOT Transport Tanks shall be verified by a pressure test as described below. The test method used shall be subject to acceptance of the Inspector and the Competent Authority, when required.

a) Liquid Pressure Test

Pressure testing of repairs, alterations, and modifications of DOT Transport Tanks shall comply with NBIC Part 3. 4.4.2(a) and the following requirements:

- 1) Liquid pressure tests shall be conducted in accordance with the requirements of the original code of construction and the regulations of the Competent Authority at pressures established in Table S6.16. When original test pressure included consideration of corrosion allowance, the test pressure may be further adjusted based on the remaining corrosion allowance;

TABLE S6.16
PRESSURE TEST REQUIREMENTS

<u>Cargo Tank Specification</u>	<u>Test Pressure</u>
<u>MC 300, MC 301, MC 302, MC 303, MC 305, and MC 306</u>	<u>20.7 kPa (3 psig) or design pressure, whichever is greater</u>
<u>MC 304 and MC 307</u>	<u>275.8 kPa (40 psig) or 1.5 times design pressure, whichever is greater</u>
<u>MC 310, MC 311, and MC 312</u>	<u>20.7 kPa (3 psig) or 1.5 times design pressure, whichever is greater</u>
<u>MC 330 and MC 331</u>	<u>1.5 times either MAWP or the re-rated pressure, whichever is applicable</u>
<u>MC 338</u>	<u>1.25 times either MAWP or the re-rated pressure, whichever is applicable</u>
<u>DOT 406</u>	<u>34.5 kPa (5 psig) or 1.5 times the MAWP, whichever is greater</u>
<u>DOT 407</u>	<u>275.8 kPa (40 psig) or 1.5 times the MAWP, whichever is greater</u>
<u>DOT 412</u>	<u>1.5 times the MAWP</u>

Note: DOT Transport Tanks constructed in accordance with Part UHT in Section VIII, Division I of the ASME Code shall be tested at a pressure at least twice the transport tank design pressure.

b) Pneumatic Test

A pneumatic test may be conducted in accordance with the requirements of the original code of construction and the regulations of the Competent Authority at pressures established in Table 6.18.

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Concurrence of the owner shall be obtained in addition to that of the Inspector and the Competent Authority, where required. Precautionary requirements of the original code of construction and NBIC Part 2, 6.13.6.1(c) shall be followed.

S6.174 ACCEPTANCE INSPECTION

The Inspector making the acceptance inspection shall be the same Inspector who authorized the repairs, alterations, or modifications. Where this is not possible or practical practicable, another Inspector may perform the acceptance inspection; however, in all cases, the Inspector who performs the acceptance inspection shall be an employee of the same organization as the Inspector who authorized the repairs, alterations, or modifications.

S6.185 GENERAL STAMPING REQUIREMENTS

The stamping of or attaching of a nameplate to a pressure-retaining item shall indicate that the work was performed in accordance with the requirements of this code and any requirements of the Competent Authority. Such stamping or attaching of a nameplate shall be done only with the knowledge and authorization of the Inspector and Competent Authority. The "R" Certificate Holder responsible for the repair or the construction portion of the modification/alteration shall apply the stamping. For a re-rating where no physical changes are made to the pressure-retaining item, the "R" Certificate Holder responsible for the design shall apply the stamping. Requirements for stamping and nameplate information are shown in NBIC Part 3, Section 5.

S6.185.1 SPECIFIC "R" STAMPING AND NAMEPLATE REQUIREMENTS

The holder of a "R" *Certificate of Authorization* is required to affix a stamping or nameplate on the Transport Tank that indicates, the repair, alteration, or modification has been performed in accordance with the requirements of NBIC Part 3, Supplement 6 and the additional requirements of the code of construction. All repairs, alterations, and modifications, after acceptance by the Registered Inspector, shall have the "R" Symbol affixed to the stamping or the nameplate. The stamping or nameplate information shall satisfy the requirements of a) thru g) below NBIC Part 3, 5.7.:

- a) The required data shall be in characters at least 4 mm (5/32 in.) high;
- b) The markings may be produced by casting, etching, embossing, debossing, stamping, or engraving;
- c) The selected method shall not result in any harmful contamination or sharp discontinuities to the pressure-retaining boundary of the Transport Tank;
- d) Stamping directly on the Transport Tank, when used, shall be done with blunt-nose continuous or blunt-nose interrupted dot die stamps. If direct stamping would be detrimental to the item, required markings and the embossed Code Symbol stamping may appear on a nameplate affixed to the Transport Tank;
- e) The "R" Certificate Holder shall use its full name as shown on the *Certificate of Authorization* or use an approved abbreviation acceptable to the National Board;
- f) The non-embossed Code Symbol stamping, when directly applied on the item or when a nameplate is used shall be applied adjacent to the original manufacturer's stamping or nameplate. A single repair stamping or nameplate may be used for additional activities performed, provided the repair activity is carried out by the same "R" Certificate Holder;
- g) The date of each repair, alteration, or modification corresponding with the date on the applicable "R" form shall be applied to the existing stamping or nameplate.

S6.18.2 REMOVAL OF ORIGINAL STAMPING OR NAMEPLATE

Removal of the original stamping or nameplate shall comply with the requirements of NBIC Part 3, 5.11. If it becomes necessary to remove the original stamping, the Inspector shall, subject to the approval of the Competent Authority, witness the making of a facsimile of the stamping, the obliteration of the old stamping, and the transfer of the stamping. When the stamping is on a nameplate, the Inspector shall witness the transfer of the nameplate to the new location. Any relocation shall be described on the applicable NBIC "R" Form. The restamping or replacement of a code symbol stamp shall be performed only as permitted by the governing code of construction.

S6.18.3 REPLACEMENT OF STAMPING OR NAMEPLATE

Replacement of indistinct stamping or lost, illegible, or detached nameplates shall comply with the requirements provided in NBIC Part 2, 5.2.

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S6.196 FORM "R" REPORTS "R" FORMS

S6.196.1 DOCUMENTATION OF FORM "R" REPORTS

Repairs, alterations, or modifications that have been performed in accordance with the NBIC shall be documented on Form R-1, *Report of Repair* or Form R-2, *Report of Alteration* as shown in NBIC Part 3, Section 5. Form R-4, *Report Supplementary Sheet*, shall be used to record additional data when space is insufficient on Form R-1 or R-2.

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S6.196.2 PREPARATION OF FORM "R" FORMS REPORTS

Preparation of "R" Forms shall be the responsibility of the "R" Certificate Holder performing the repairs, alterations, or modifications and shall comply with the requirements provided in NBIC Part 3, 5.2.1, 5.2.2 and 5.2.4. An Inspector shall indicate acceptance by signing the appropriate "R" form.

S6.196.3 DISTRIBUTION OF FORM "R" REPORTS

Distribution of Form "R" Reports shall comply with the requirements provided in NBIC Part 3, 5.3 and 5.4.

a) Legible copies of the completed "R" forms together with attachments shall be distributed to the owner or user, the Inspector, the Competent Authority as required, the Authorized Inspection Agency responsible for the inspection, and the National Board for registration.

b) Distribution of the "R" forms and attachments shall be the responsibility of the "R" Certificate Holder performing the work.

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S6.196.4 REGISTRATION OF FORM R-1 AND FORM R-2 "R" REPORTS

a) Organizations Repair organizations performing repairs, alterations, or modifications required by this supplement shall register such repairs, alterations, or modifications with the National Board. submit the completed "R" Form, meeting the requirements of the NBIC, to the National Board.

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b) The repair organization shall maintain a sequential Form "R" Registration Log Log that shall identify the following: as described in Part 3, 5.6.

- 1) Form number assigned for Form R-1;
- 2) Identify if the activity was a repair, alteration, or modification;
- 3) When the repair, alteration, or modification was completed, and
- 4) Date sent to the National Board.

S6.17 — ADDITIONAL REQUIREMENTS FOR REPAIRS, ALTERATIONS, OR MODIFICATIONS

S6.17.1 — SCOPE

This section provides additional requirements for repairs, alterations, or modifications to DOT Transport Tank pressure-retaining items and shall be used in conjunction with NBIC Part 3.

S6.17.2 — REPAIRS OF DEFECTS

~~Before a repair is made to a defect in a welded joint or base metal, care should be taken to investigate its cause and to determine its extent and likelihood of recurrence. This information shall be made available to the Inspector.~~

S6.17.3 — MODIFICATIONS

All modifications to the pressure-retaining item shall meet the requirements of NBIC Part 3 for alterations.

S6.17.4 — DRAWINGS

- ~~Drawings or instructions shall be prepared to describe the repair, alterations, or modification. Drawings shall include sufficient information to satisfactorily perform the activity.~~

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S6.17.5 — AUTHORIZATION

~~Repairs, alterations, or modifications to a pressure-retaining item shall not be initiated without the authorization of the Inspector, who shall determine that the methods are acceptable.~~

S6.18 — EXAMINATION AND TEST

The following requirements shall apply to all repairs, alterations, or modifications to DOT Transport Tank pressure-retaining items:

- a) ~~The integrity of repairs and replacement parts used in repairs, alterations, or modifications shall be verified by examination and test;~~
- b) ~~The "R" Certificate Holder is responsible for all activities relating to examination and test of repair, alterations, or modifications;~~
- c) ~~Examination and tests to be used shall be subject to acceptance of the Inspector and the Competent Authority when required.~~

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S6.18.1 — METHODS

One, or a combination of the following examination methods, shall be applied to DOT Transport Tank pressure-retaining items with the concurrence of the Inspector and the Competent Authority when required.

a) ~~————~~ Liquid Pressure Test

Pressure testing of repairs shall meet the following requirements:

- 1) ~~————~~ Pressure tests shall be conducted using water or other suitable liquid. The test pressure shall be the minimum required to verify the leak tightness integrity of the repair, but not more than 150% of the maximum allowable working pressure (MAWP) stamped on the pressure-retaining item, as adjusted for temperature. When original test pressure included consideration of corrosion allowance, the test pressure may be further adjusted based on the remaining corrosion allowance;
- 2) ~~————~~ During a pressure test where the test pressure will exceed 90% of the set pressure of the pressure relief device, the device shall be removed whenever possible. If not possible, a test gag should be used using the valve manufacturer's instructions and recommendations; and
- 3) ~~————~~ Hold time for the pressure test shall be a minimum of 10 minutes prior to examination by the Inspector. Where the test pressure exceeds the MAWP of the item, the test pressure shall be reduced to the MAWP for close examination by the Inspector. Hold time for close examination shall be as necessary for the Inspector to conduct the examination.

b) ~~————~~ Pneumatic Test

A pneumatic test may be conducted. Concurrence of the owner shall be obtained in addition to that of the Inspector and the Competent Authority where required. The test pressure shall be the minimum required to verify leak tightness integrity of the repair, but shall not exceed the maximum pneumatic test pressure of the original code of construction. Precautionary requirements of the original code of construction shall be followed.

c) ~~————~~ Nondestructive Examination

Nondestructive examination (NDE) may be conducted. NDE methods shall be suitable for providing meaningful results to verify the integrity of the repair.

S6.19 — REPAIRS, ALTERATIONS, OR MODIFICATION REPORTS

- a) ~~————~~ When repairs, alterations, or modifications are performed on a transport tank, i.e., cargo tank, portable tank, or ton tank, the owner or User shall have the activity performed by a Repair Organization that has a valid "R" *Certificate of Authorization* issued by the National Board. "R" forms shall be completed and certified by the "R" Certificate Holder and received and certified by the Inspector.
- b) ~~————~~ For the purposes of documentation and stamping, modification shall be considered an alteration.

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PROPOSED REVISION OR ADDITION

Item No.: 21-02
Subject Title: Define "Fuel Loading" as it pertains to NR activities.
NBIC Location: Part 3 Repairs and Alterations: 1.6.2 a)
Project Manager and Task Group: Raymond Spuhl, NR TG
Source Name and Email: Terrence Hellman, thellman@nationalboard.org
Statement of Need: The NR TG would like to clarify "Fuel Loading" as used to determine Category 1, 2 or 3 NR activities.
Background Information:
Existing Text: 1.6.2 a) 1) Category 1 Any ASME Section III Code certified item or system requiring repair/replacement activities irrespective of physical location and installation status prior to fuel loading. 2) Category 2 After fuel loading, any item or system under the scope of ASME Section XI requiring repair/ replacement activities irrespective of physical location. Based on regulatory or jurisdictional acceptance, Category 2 may be used prior to fuel loading. 3) Category 3 Items other than those covered by Category 1 or Category 2, requiring repair/replacement activities irrespective of physical location, installation status and fuel loading.
Proposed Text: 1.6.2 a) 1) Category 1 Any ASME Section III Code certified item or system requiring repair/replacement activities irrespective of physical location and installation status prior to fuel loading <u>not under the scope of ASME Section XI.</u> 2) Category 2 After fuel loading, a Any item or system under the scope of ASME Section XI requiring repair/ replacement activities irrespective of physical location <u>under the scope of ASME Section XI-</u> b Based on regulatory or jurisdictional <u>requirements</u> acceptance, Category 2 may be used prior to fuel loading. 3) Category 3 <u>Any item or system,</u> other than those covered by Category 1 or Category 2, requiring repair/replacement activities irrespective of physical location, installation status and fuel loading.

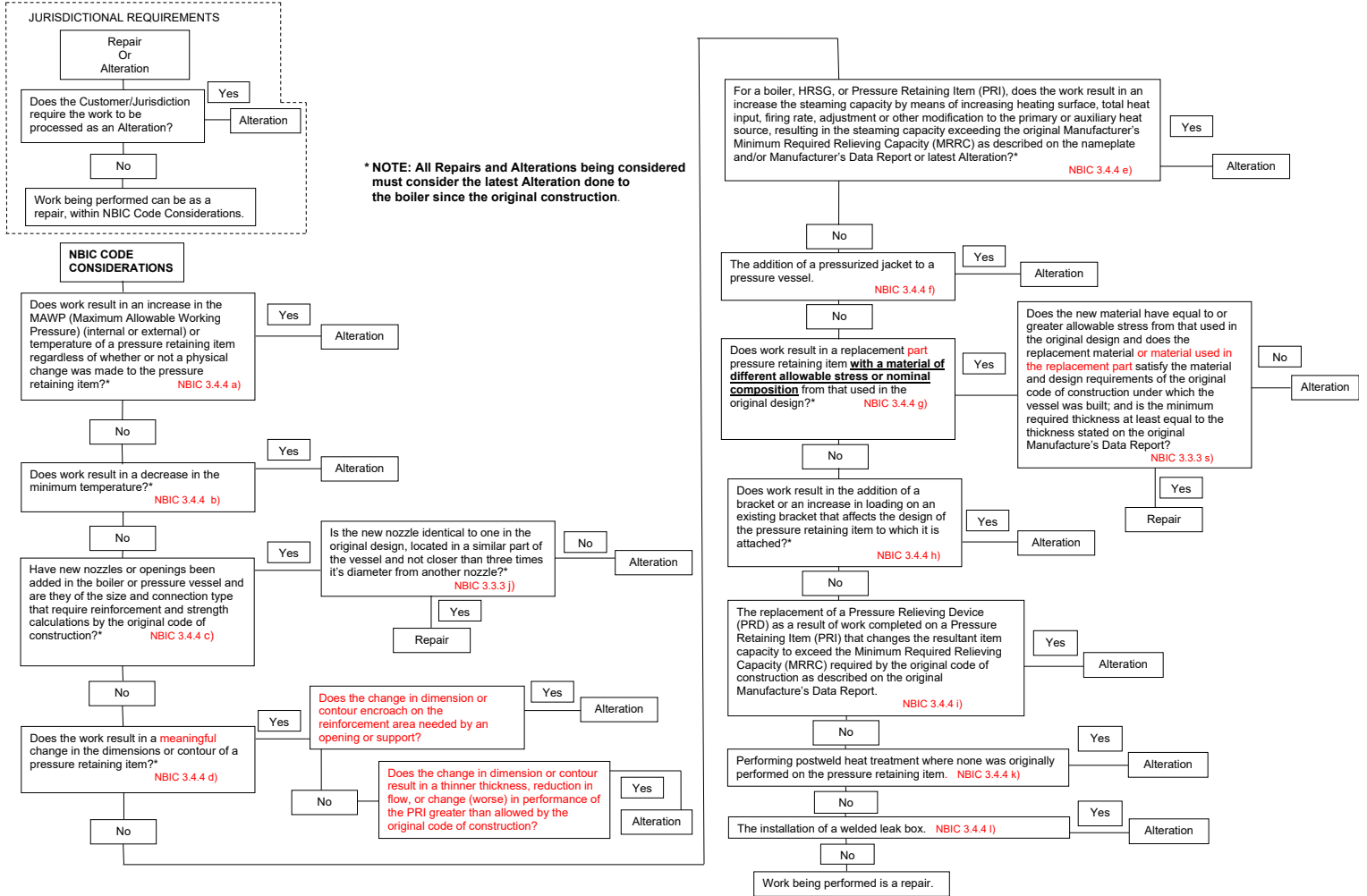
PROPOSED REVISION OR ADDITION

Item No. A 21-12	
Subject/Title Revision to modify Term 'Alteration' and to add Guidance on classifying a Repair vs Alteration	
NBIC Location Part: Repairs and Alterations; Section: Section 3	
Project Manager and Task Group P. Becker (PM), K. Moore, B. Underwood, P. Shanks, S. Chestnut, T. Seime	
Source (Name/Email) Pat Becker, pabecker@babcock.com	
Statement of Need <p>Interpretations continue to be received based on confusion in current guidance given in Section 3, Part 3 of Repairs and Alterations. Of particular issue is the heavily relied upon 'List of Examples' of Repairs and Alterations. The lists are considered a 'shortcut' to understanding which activities should be classified as repairs and which should be alterations. However, the examples are not intended to be used without the understanding of the rest of the subject matter in Part 3, Section 3...nor are they all-inclusive or exclusive.</p> <p>Experience levels can vary widely among all 'stakeholder' categories, i.e. Owner/User, Authorized Inspector, Certificate Holder, In-Service inspector, Jurisdictional Authority etc.</p> <p><i>From the Forward: The general philosophy underlying the NBIC is to parallel those provisions of the original code of construction, as they can be applied to post-construction activities. The NBIC does not contain rules to cover all details of post-construction activities. Where complete details are not given, it is intended that individuals or organizations, subject to the acceptance of the Inspector and Jurisdiction when applicable, provide details for post-construction activities that will be as safe as otherwise provided by the rules in the original code of construction.</i></p> <p>The Intent of any effort is to improve the user experience while being cognizant not to overly restrict. The task group is paying attention to industry concerns and suggestions including the potential impact of any changes to existing equipment and installations. Existing Interpretations are being 'walked thru' the decision tree and otherwise reviewed against the addition of any content. The goal is to provide clearer guidance with less conflicting or overlapping examples or information.</p>	
Background Information Update of Part 3 Section 3 to improve User experience and clarify definition of 'Alteration'. Updated 'problematic' example lists to eliminate 'conflicting examples'.	
Existing Text	Proposed Text
<p style="text-align: center;">PART 3, SECTION 3 REPAIRS AND ALTERATIONS — REQUIREMENTS FOR REPAIRS AND ALTERATIONS</p> <p>3.1 SCOPE</p> <p>This section provides requirements and guidelines for materials, replacement parts, and methods used when performing repairs and alterations to pressure-retaining items. Specific repair or alteration methods for other types of pressure equipment are in NBIC Part 3, Section 6.</p> <p>3.2 GENERAL REQUIREMENTS FOR REPAIRS AND ALTERATIONS</p> <p>(21) 3.2.1 MATERIAL REQUIREMENTS FOR REPAIRS AND ALTERATIONS</p>	<p style="text-align: center;">PART 3, SECTION 3 REPAIRS AND ALTERATIONS — REQUIREMENTS FOR REPAIRS AND ALTERATIONS</p> <p><u>3.0 INTRODUCTION</u></p> <p><u>This Section provides information on the requirements for repairs and alterations to pressure retaining items. Information on how to classify, perform, verify, and document acceptable repair and alteration activities may be found throughout Part 3 Sections and Supplements (Refer to the Table of Contents for detail on the location of relevant information). It is the intent that this Section be used in cooperation with local jurisdictional authorities and with an understanding of the applicable pressure vessel code regulations relevant to the scope of repair or alteration activity. Note that the guidance herein and the examples given are not all inclusive and are intended to be representative of cases and activities commonly considered either a repair or alteration.</u></p> <p>3.1 SCOPE</p> <p>This section provides requirements and guidelines for materials and methods used when performing repairs and alterations to pressure-retaining items. Specific repair or alteration methods for other types of pressure equipment are in NBIC Part 3, Section 6.</p>

**SUPPLEMENT X
CLASSIFYING REPAIRS AND ALTERATIONS**

SX.1 SCOPE

**FIGURE SX.1
DECISION TREE (LOGIC DIAGRAM) FOR DETERMINING REPAIR OR ALTERATION ACTIVITY CLASSIFICATION**





PROPOSED REVISION OR ADDITION

Item No. A 21-43	
Subject/Title Defining and revising "Practicable" and "Practical" within the NBIC	
NBIC Location Part: Repairs and Alterations; Section: 9; Paragraph: Glossary - All Parts	
Project Manager and Task Group Marty Toth, Subcommittee Repairs/Alterations	
Source (Name/Email) Marty Toth / mtoth@boiscotraininggroup.com	
Statement of Need Defining and revising Practicable and Practical within the NBIC and revising where applicable	
Background Information Defining and revising Practicable and Practical within the NBIC and revising where applicable	
Existing Text	Proposed Text Practicable: An NBIC activity such as, but not limited to, a process, action, test, or examination that is able to be done or performed. Practical: An NBIC activity such as, but not limited to, a process, action, test, or examination that is able to provide useful and suitable results.



PROPOSED REVISION OR ADDITION

Item No. A 21-44	
Subject/Title Defining "De-Rating" within Part 3	
NBIC Location Part: Repairs and Alterations; Section: Section 3; Paragraph: 3.4.1	
Project Manager and Task Group Marty Toth, Subcommittee Repairs/Alterations	
Source (Name/Email) Marty Toth / mtoth@boiscotraininggroup.com	
Statement of Need Defining de-rating within Part 3	
Background Information Defining de-rating within Part 3	
Existing Text	Proposed Text Derate (Boiler): The decrease of a high-pressure steam boiler's MAWP at or below 15 psi where consideration and the replacement of safety valves, steam outlet piping size, and controls and safety devices needs to be made, subject to the requirements of the Jurisdiction where the boiler is installed.

COMMITTEE	VOTE:				Passed	Failed	Date
	Approved	Disapproved	Abstained	Not Voting			

SUPPLEMENT XX - REPAIR METHODS OF PRESSURE VESSELS AND PIPING EXCLUSIVE TO OIL, GAS, AND CHEMICAL INDUSTRIES

SXX.1 SCOPE

This supplement provides methods for repair of pressure retaining items, outside the boiler setting through the administrative boundary of ASME Section I and IV, exclusive to oil, gas, and chemical manufacturing.

SXX.2 CONSTRUCTION STANDARDS

Repairs shall conform, insofar as possible, to the relevant requirements of the edition of the code of construction. Where this is not practicable, it is permissible to use other codes, standards, or specifications, provided the "R" Certificate Holder has the concurrence of the Inspector and the Jurisdiction, where required.

SXX.3 LIMITATIONS

Repairs will be limited to pressure retaining items, which comply with the following conditions:

- a) Operates at or below 650°F (345°C) for carbon steels or below the time dependent service temperatures for low alloy steel.
- b) Impact testing was not required.
- c) Not used in lethal service.
- d) No environmental or service-related cracking conditions exist, except as provided by NBIC Part 3, 3.3.4.8.

SXX.4 JURISDICTIONAL REQUIREMENTS

Repairs will require notification to the Jurisdiction and where required, Jurisdictional approval prior to performing work.

SXX.5 REPAIR METHODS

a) WELDED LAP PATCH

A welded lap patch is a repair method used to maintain the structural integrity of the pressure retaining item by providing an external boundary over the area exhibiting damage in the form of a "welded lap patch" as described by ASME PCC-2 (i.e. Full Encirclement Steel Reinforcing Sleeves for Piping, Fillet Welded Lap Patches with Reinforcing Plug Welds, or Fillet Welded Lap Patches).

- 1) Welded lap patches shall be further restricted as follows:
 - a. A lap patch installed over an existing lap patch is prohibited.
 - b. The distance between lap patches shall not be less than $2\sqrt{Rt}$ where R is the outside radius of the spherical or cylindrical shell in inches (mm), and t is equal to the nominal wall thickness of the spherical or cylindrical shell in inches (mm).
- 2) Except as required in Part 3, Paragraph SXX.5 a)4)a), ASME PCC-2 shall be used for the design of the welded lap patch and shall be in accordance with the original code of construction, when practicable. Design of a welded lap patch shall consider original design conditions, taking in to account current service conditions and damage mechanisms. Use of this method shall be acceptable to the Inspector and where required, the Jurisdiction and shall be limited to pressure containing equipment owned and operated by an owner or user.
 - a. Lap patch material should be the same (e.g., composition, physical and mechanical properties) to that of the pressure retaining items' original construction. Lap patch material of a different nominal composition and, equal to or greater in allowable stress from that used in the original design, may be

- used provided the material satisfies the requirements of the original code of construction under which the vessel was built.
- 3) The “R” Certificate Holder responsible for the design of the welded lap patch shall ensure a Fitness for Service Assessment (FFSA) has been performed on the area of the item being patched in accordance with NBIC, Part 2, 4.4.1, supporting the continued service of the item. The welded lap patch repair method shall not remain in place beyond the calculated remaining life of the covered portion of the pressure retaining item.
 - a) The remaining life of the pressure retaining item shall be documented on the Form NB-403 in the Remarks section. The Form NB-403 shall be affixed to the Form R-1 and identified in the Remarks section. A National Board Commissioned Inspector holding an “R” endorsement as described in NB-263, RCI-1 shall sign both the Form R-1 and the attached NB-403.
 - b) The thinned or leaking area shall be fully covered, as specified in the FFSA, to the distance where the minimum required metal thickness is verified. Wall thickness shall be verified in the area to be welded.
 - c) A welded lap patch method shall not be used where cracks are present unless the cracks have been removed and repaired in accordance with NBIC Part 3, 3.3.4.2 a) and the condition that led to the crack formation and propagation has been eliminated.
 - 4) Hazards associated with welding on degraded components should be addressed with the owner or user by the use of engineering controls, administrative controls and personal protective equipment.
 - a) When the pressure retaining item will remain in service while implementing a welded lap patch, the requirements and limitations described within ASME PCC-2, Part-1 shall be used in conjunction with ASME PCC-2, Part-2.
 - b) API RP-2201, “Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries” may be used as a guideline for identifying hazards associated with welding to a component that is under pressure, including service restrictions.
 - 5) Test or examination methods shall be in accordance with NBIC, Part 3, 4.4.1.

SXX.6 Post Repair Inspection

- a) After the completion of weld repairs, post repair inspection requirements shall be established in accordance with NBIC Part 3, 3.3.4.8.

SXX.7 Documentation

- a) Documentation and distribution requirements for repair methods identified in this supplement are identified in NBIC Part 3, Section 5.

SXX.8 Registration

- a) Organizations performing repairs under an “R” stamp program shall register such repairs with the National Board.



PROPOSED REVISION OR ADDITION

Item No. A21-53	
Subject/Title Supplement 8 Weld and Post Repair Inspection of Creep Strength Enhanced Ferritic Steel Pressure Equipment	
NBIC Location NBIC Part 3 Repairs and Alterations Supplement 8 S8.5 a)	
Project Manager and Task Group Philip Gilston	
Source (Name/email) Mark Kincs / mark.r.kincs@xcelenergy.com	
Statement of Need The requirement for Inspector involvement in post-repair inspections to CSEF weld repairs is to ensure future safe operation of the boiler. This is a function of the in service Authorized Inspection Agency, not the Repair Inspector, whose duties end with completion of repair documentation.	
Background Information The post-repair inspection requirements specified in S8.5 are unique. There is no other mention of such inspections elsewhere in NBIC–Part 3. Presumably, Welding Method 6 repairs don't require post-repair inspection due to the perceived low-level of associated risk (inside the boiler setting).	
<p>S8.5 POST REPAIR INSPECTION</p> <p>a) After the completion of weld repairs to CSEF steels, post inspection requirements shall be developed and implemented based on acceptance from the Inspector, and if applicable, the Jurisdiction.</p> <p>b) Post-repair inspection intervals and methods of examination shall be implemented to ensure safe operation and margin to locate and monitor defect growth in the weld repair area. The selected non-destructive examination method shall provide meaningful results and shall follow NBIC Part 3, Section 4.</p> <p>c) Post repair inspection shall be on-going until the component reaches end of life or is replaced. The Owner/User may revise the re-inspection interval based on inspection results from previous inspections.</p>	<p>S8.5 POST REPAIR INSPECTION</p> <p>a) After the completion of weld repairs to CSEF steels, post inspection requirements shall be developed and implemented based on acceptance from the <u>Inspector in service Authorized Inspection Agency of the pressure retaining item</u>, and if applicable, the Jurisdiction.</p> <p>b) Post-repair inspection intervals and methods of examination shall be implemented to ensure safe operation and margin to locate and monitor defect growth in the weld repair area. The selected non-destructive examination method shall provide meaningful results and shall follow NBIC Part 3, Section 4.</p> <p>c) Post repair inspection shall be on-going until the component reaches end of life or is replaced. The Owner/User may revise the re-inspection interval based on inspection results from previous inspections.</p>

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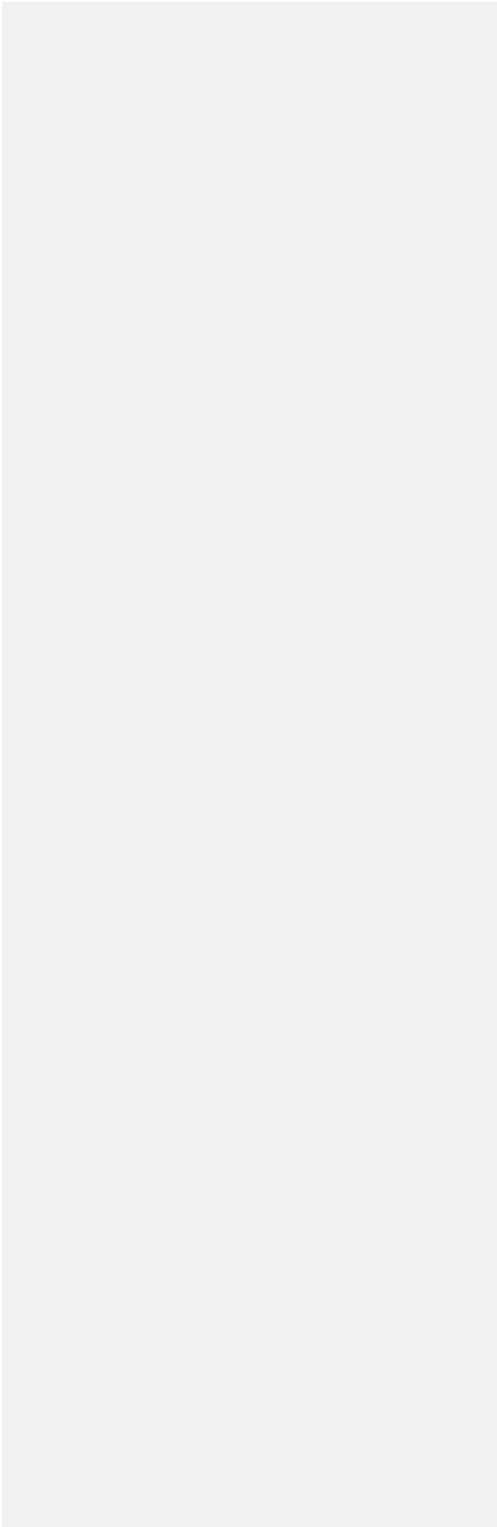


THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS

PROPOSED REVISION OR ADDITION

Item No. 21-67	
Subject/Title Removal of reference to mechanical portion and add additional information for welding	
NBIC Location Part 3 Repairs and Alterations, Section 3, Paragraph 3.3.4.9	
Project Manager and Task Group PM – Philip Gilston TG – Kathy Moore & Trevor Seime	
Source (Name/email) Kathy Moore / kathy.moore@joemoorecompany.com	
Statement of Need Removing the mechanical portion of the text. Many Jurisdictions are having a difficult time enforcing that part of the NBIC. Additionally, cracking of ligaments in welded plug is a common issue, the current NBIC does not have enough direction or requirements for welding tube plugs in firetube boiler.	
Background Information Mr. Kinney wrote on the Chief's Forum and asked the Chiefs what they thought of 3.3.4.9. They wanted the mechanical portion dropped. Improper welding of tube plugs in firetubes often creates ligament cracks. Originally the part addressing mechanical plugs was action item 21-71, the item has been combined here to make for a clean proposal	
Existing Text 3.3.4.9 TUBE PLUGGING IN FIRETUBE BOILERS When the replacement of a tube in a firetube boiler is not practicable at the time the defective tube is detected, with the concurrence of the owner, Inspector, and when required, the Jurisdiction, the tube may be plugged using the following course of repair: a) The scope of work, type of plug and method of retention; whether welded or mechanical interface, shall be evaluated by the "R" Certificate Holder performing the repair and reviewed with the Inspector, and when required, the Jurisdiction. b) When the method of plugging is by welding, strength calculations for the size of the weld shall be in accordance with the original code of construction. The "R" Certificate Holder performing this repair shall weld the plug to the tube, or to the tube sheet, or a	Proposed Text 3.3.4.9 TUBE PLUGGING IN FIRETUBE BOILERS When the replacement of a tube in a firetube boiler is not practicable at the time the defective tube is detected, with the concurrence of the owner, Inspector, and when required, the Jurisdiction, the tube may be plugged using the following course of repair: - a) The scope of work, type of plug and method of retention; whether welded or mechanical interface, shall be evaluated reviewed by the <u>Owner, the In-Service Inspector, and when required, the Jurisdiction. If the method of retention is to by welding, then</u> the "R" Certificate Holder <u>and the Repair Inspector</u> performing the repair and reviewed with <u>shall also perform a review, the Inspector, and when required, the</u> Jurisdiction.

	<p>b) Plugging a tube in a firetube boiler is recognized as <u>temporary</u> alternative to the replacement of a</p>
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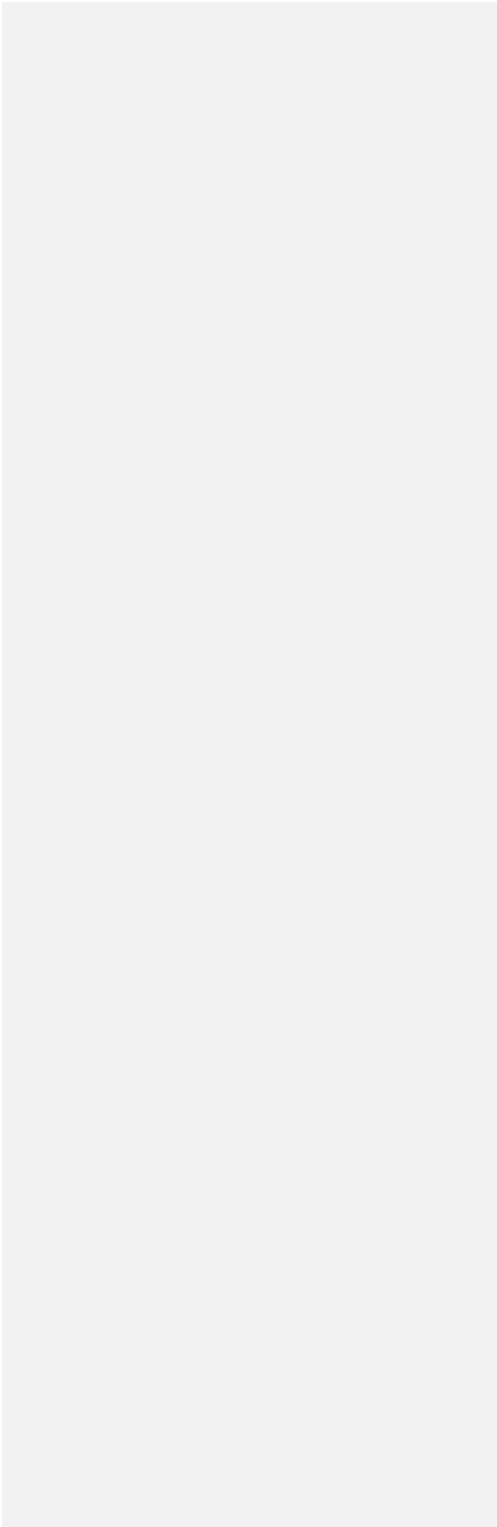
<p>combination of both.</p> <p>c) Plugging a tube in a firetube boiler is recognized as an alternative to the replacement of a firetube and may be further limited as a method of repair by the number of tubes plugged and their location; scattered or clustered. The operational effects on the waterside pressure boundary or membrane and the effects on the combustion process throughout the boiler should be considered prior to plugging.</p> <p>d) The boiler may be returned to service for a period of time agreed upon by the owner, the Inspector, and when required, the Jurisdiction.</p> <p>b) The Form R 1 shall be completed for the plugging of firetubes, identifying the means of plug retention; mechanical or by welding.</p>	<p>firetube and may be further limited as a method of repair by the number of tubes plugged and their location; scattered or clustered. The operational effects on the waterside pressure boundary or membrane and the effects on the combustion process throughout the boiler should be considered prior to plugging.</p> <p>c) <u>When the method of plugging is by welding:</u></p> <ol style="list-style-type: none"> 1. <u>Strength calculations for the size of the weld shall be in accordance with the original code of construction. The "R" Certificate Holder performing this repair shall weld the plug to the tube, or to the tube sheet, or a combination of both.</u> 2. <u>Cracking of ligaments due to the use of welded plugs is a common issue. To mitigate this possible occurrence the "R" Certificate Holder performing the repair may consider actions including but not limited to the following:</u> <ol style="list-style-type: none"> i) <u>For P-No. 1 materials, preheating to 200°F (95°C) minimum</u> ii) <u>Limiting the maximum weld size to 3/8" (9 mm)</u> iii) <u>Limiting electrode size to 1/8" (3.2 mm) maximum diameter</u> iv) <u>Using a stringer bead technique.</u> v) <u>Using a minimum of two passes</u> 3. <u>NDE in lieu of pressure testing is not permitted.</u> 4. <u>After welding is completed, consideration should be given to re-rolling adjoining tubes.</u> 5. <u>The Form R-1 shall be completed for the plugging of firetubes by the use of welding.</u> 5-6. <u>The plugging of boiler tubes on any boiler type shall not be documented as a routine repair on the R-1 Report of Repair Form.</u> <p>d) The boiler may be returned to service for a period of time agreed upon by the owner, the <u>In-Service</u> Inspector, and when required, the Jurisdiction.</p> <p>d) <u>The plugging of boiler tubes on any boiler type shall not be documented as a routine repair on the R-1 Report of Repair Form.</u></p> <p>e) <u>The Form R-1 shall be completed for the plugging of firetubes, identifying the means of plug retention; mechanical or by welding.</u></p>
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ITEM 21-70

2.3 STANDARD WELDING PROCEDURE SPECIFICATIONS (SWPSs)

a) One or more SWPSs from NBIC Part 3, Table 2.3 may be used as an alternative to one or more WPS documents qualified by the organization making the repair or alteration, provided the organization accepts by certification (contained therein) full responsibility for the application of the SWPS in conformance with the Application as stated in the SWPS. When using SWPSs, all variables listed on the Standard Welding Procedure are considered essential and, therefore, the repair organization cannot deviate, modify, amend, or revise any SWPS. US Customary Units or metric units may be used for all SWPSs in NBIC Part 3, Table 2.3, but one system shall be used for application of the entire SWPS in accordance with the metric conversions contained in the SWPS. The user may issue supplementary instructions as allowed by the SWPS. Standard Welding Procedures Specifications shall not be used in the same product joint together with the other Standard Welding Procedure Specifications or other welding procedure specifications qualified by the organization. SWPSs may be purchased at the AWS Bookstore at <http://pubs.aws.org>.

b) The AWS reaffirms, amends or revises SWPSs in accordance with ANSI procedures.

c) The use of previous versions of the listed SWPSs is permitted. Previous versions include Amended, Reaffirmed Revised or Superseded SWPSs regardless of the publication date.

TABLE 2.3**SWPS DESIGNATION: YEAR**

B2.1-1-001: 2020	B2.1-1-201: 2019	B2.1-8-215: 2012	B2.1-1/8-229: 2013
B2.1-1-002: 2020	B2.1-1-202: 2019	B2.1-8-216: 2012	B2.1-1/8-230: 2013
B2.1-1-016: 2018	B2.1-1-203: 2019	<u>B2.1-4-217: 2021</u>	B2.1-1/8-231: 2015
B2.1-1-017: 2018	B2.1-1-204: 2019	<u>B2.1-4-218: 2021</u>	B2.1-1-232: 2020
<u>B2.1-1-018: 2021</u>	B2.1-1-205: 2019	<u>B2.1-4-219: 2021</u>	B2.1-1-233: 2020
B2.1-1-019: 2018	B2.1-1-206: 2019	<u>B2.1-4-220: 2021</u>	<u>B2.1-1-234: 2020</u>
B2.1-1-020: 2018	B2.1-1-207: 2019	<u>B2.1-4-221: 2021</u>	<u>B2.1-1-235: 2020</u>
B2.1-1-021: 2018	B2.1-1-208: 2019	<u>B2.1-5A-222: 2022</u>	
B2.1-1-022: 2018	B2.1-1-209: 2019	<u>B2.1-5A-223: 2022</u>	
B2.1-8-023: 2018	B2.1-1-210: 2012	<u>B2.1-5A-224: 2022</u>	
B2.1-8-024: 2012	B2.1-1-211: 2012	<u>B2.1-5A-225: 2022</u>	
B2.1-8-025: 2012	B2.1-8-212: 2012	<u>B2.1-5A-226: 2022</u>	
B2.1-1-026: 2018	B2.1-8-213: 2012	B2.1-1/8-227: 2013	
B2.1-1-027: 2018	B2.1-8-214: 2012	B2.1-1/8-228: 2013	

PROPOSED REVISION OR ADDITION

Item No. A 22-04	
Subject/Title Clarification on Part 3, 3.3.3 s)	
NBIC Location Part: Repairs and Alterations; Section: 3.3.3; Paragraph: s)	
Project Manager and Task Group	
Source (Name/Email) Tom White / Thomas.white@nrg.com	
Statement of Need The paragraph was written for pressure-retaining parts not just vessels as stated later in the first sentence.	
Background Information Researching alteration examples 3.4.4 (g) which states: except as permitted in NBIC Part 3, 3.3.3 s);	
Existing Text s) Replacement of a pressure-retaining part with a material of different nominal composition and, equal to or greater in allowable stress from that used in the original design, provided the replacement material satisfies the material and design requirements of the original code of construction under which the vessel was built. The minimum required thickness shall be at least equal to the thickness stated on the original Manufacturer's Data Report;	Proposed Text s) Replacement of a pressure-retaining part with a material of different nominal composition and, equal to or greater in allowable stress from that used in the original design, provided the replacement material satisfies the material and design requirements of the original code of construction under which the vessel <u>pressure-retaining item</u> was built. The minimum required thickness shall be at least equal to the thickness stated on the original Manufacturer's Data Report;

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PART 3, SECTION 1 REPAIRS AND ALTERATIONS — GENERAL AND ADMINISTRATIVE REQUIREMENTS

1.1 SCOPE

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- a) This part provides requirements and guidelines that apply when performing repairs and alterations to pressure-retaining items.
- b) The National Board administers four specific accreditation programs:
 - 1) "R" — Repairs and Alterations to Pressure-Retaining Items
 - 2) "NR" — Repair and Replacement Activities for Nuclear Items
 - 3) "VR" — Repairs to Pressure Relief Valves
 - 4) "T/O" — Test Only of Pressure Relief Valves
- c) This part describes some of the administrative requirements for the accreditation of repair organizations. Additional administrative requirements can be found in:
 - 1) NB-415, *Accreditation of "R" Repair Organizations*
 - 2) NB-417, *Accreditation of "NR" Repair Organizations*
 - 3) NB-514, *Accreditation of "VR" Repair Organizations*
 - 4) NB-528, *Accreditation of "T/O" Test Only Organizations*
- d) Requirements for repairs to pressure relief valves can be found in NBIC Part 4.

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1.2 CONSTRUCTION STANDARDS FOR PRESSURE-RETAINING ITEMS

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- a) Repairs and alterations shall conform, insofar as possible, to the edition and addenda of the original code of construction, standard or specification used during the initial fabrication of the pressure-retaining item, or a later edition and addenda most applicable to the work planned.
- ~~a) When the standard governing the original construction is the ASME Code or ASME RTP-1, repairs and alterations to pressure-retaining items shall conform, insofar as possible, to the section and edition of the ASME Code most applicable to the work planned.~~
- b) If the pressure-retaining item was not constructed using an original code of construction, standard or specification is unknown, to a construction code or standard, or when the standard governing the original construction is not the ASME Code or ASME RTP-1, repairs or alterations shall conform, insofar as possible, to the edition of the construction standard or specification most applicable to the work. Where this is not possible or practicable, or if the use of the original code of construction, standard or specification is not possible or practicable, it is permissible to use other codes, standards, or specifications most applicable to the work planned, including the ASME Code or ASME RTP-1, provided the "R" or "NR" Certificate Holder has the concurrence of the Inspector and the Jurisdiction where the pressure-retaining item is installed.
- c) For historical boilers, ASME, Section I provides rules for design and features of construction.
- d) Piping systems are designed for a variety of service conditions such as steam, water, oil, gas, or air. Design requirements for repairs and alterations are to meet the original code of construction or the code most appropriate for the repair or alteration. These systems shall be designed for the most severe conditions of pressure, temperature, loadings, and expected transients considered for normal operation. All pipe materials, fittings, and valves shall be rated for the maximum service conditions for normal operation. Design corrosion of piping systems should also be considered when determining types of materials and thicknesses.

PART 3, SECTION 4

REPAIRS AND ALTERATIONS — EXAMINATION AND TESTING

4.1 SCOPE

This section provides requirements and guidelines for performing examinations and tests for repairs and alterations to pressure-retaining items.

(21) 4.2 NONDESTRUCTIVE EXAMINATION

- a) ~~The n~~Nondestructive examination (NDE) requirements, including technique, extent of coverage, procedures, personnel qualification, and acceptance criteria, shall be in accordance with the original code of construction, standard or specification selected for the repair or alteration of for the pressure-retaining item (see NBIC Part 3, 1.2). ~~Weld repairs and alterations shall be subjected to the same nondestructive examination requirements as the original welds.~~ Where this is not possible or practicable, alternative NDE methods acceptable to the Inspector and the Jurisdiction where the pressure-retaining item is installed, where required, may be used, provided that all other requirements of this section are met.
- b) NDE personnel shall be qualified and certified in accordance with the requirements of the original code of construction. When this is not possible or practicable, NDE personnel may be qualified and certified in accordance with their employer's written practice. ASNT SNT-TC-1A, *Recommended Practice Non-destructive Testing Personnel Qualification and Certification* (2006 edition), or ANSI/ASNT CP-189, *Standard for Qualification and Certification of Nondestructive Testing Personnel* (2006 edition), shall be used as a guideline for employers to establish their written practice. Provisions for training, experience, qualification, and certification of NDE personnel shall be described in the "R" Certificate Holder's written quality system.

4.3 PRESSURE GAGES, MEASUREMENT, EXAMINATION, AND TEST EQUIPMENT

The calibration of pressure gages, measurement, examination, and test equipment, and documentation of calibration shall be performed, as required, by the applicable standard used for construction.

4.4 EXAMINATION AND TEST FOR REPAIRS AND ALTERATIONS

The following requirements shall apply to all repairs and alterations to pressure-retaining items:

- a) The integrity of repairs, alterations, and replacement parts used in repairs and alterations shall be verified by examination or test;
- b) Testing methods used shall be suitable for providing meaningful results to verify the integrity of the repair or alteration. Any insulation, coatings, or coverings that may inhibit or compromise a meaningful test method shall be removed, to the extent identified by the Inspector;
- c) The "R" Certificate Holder is responsible for all activities relating to examination and test of repairs and alterations;
- d) Examinations and tests to be used shall be subject to acceptance of the Inspector and, where required, acceptance of the Jurisdiction.

4.4.1 TEST OR EXAMINATION METHODS APPLICABLE TO REPAIRS

Based on the nature and scope of the repair activity, one or a combination of the following examination and test methods shall be applied to repairs and replacement parts used in repairs.

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**SUPPLEMENT 5
GENERAL REQUIREMENTS FOR REPAIRS AND ALTERATIONS TO YANKEE DRYERS
S5.1 SCOPE**

This supplement provides requirements and guidelines for repairs and alterations to Yankee dryer pressure retaining components and shall be used in conjunction with inspection requirements identified in NBIC Part 2, *Inspection* Supplement 5.

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S5.2 EXAMINATIONS AND TEST METHODS

In addition to the requirements of NBIC Part 3, 4.4.1 and 4.4.2, the following are recommended: The following supplemental examination and test methods may be used in addition to the requirements of NBIC Part 3, 4.4.1 and 4.4.2:

- a) Acoustic emission testing; and
- b) Metallographic examination when thermal damage is suspected due to operational or repair activities.

S5.3 YANKEE DRYER REPAIR METHODS

This supplement provides additional requirements for repair methods to Yankee Dryer pressure-retaining components and shall be used in conjunction with NBIC Part 3, Section 2 through 5 of this part, as appropriate.

S5.3.1 REPLACEMENT PARTS FOR YANKEE DRYERS

- a) Yankee dryer replacement pressure-retaining parts shall be fabricated in accordance with the manufacturer's design and the original code of construction. Yankee dryer pressure-retaining parts may include:
 - 1) shell;
 - 2) heads;
 - 3) center shaft, stay, or trunnion;
 - 4) stay bars;
 - 5) structural bolting; and
 - 6) journals.
- b) Replacement of non-pressure-retaining parts, when different from the manufacturer's design, shall be evaluated for any possible effect on the pressure-retaining parts.

S5.4 REPAIR GUIDE FOR YANKEE DRYERS

a) Welding or brazing shall not be used on any Yankee dryer pressure-retaining component manufactured from cast iron. The *Manufacturer's Data Report* shall be carefully reviewed to determine the material of construction of each Yankee dryer component such as shell, heads, and journals.

b) ~~Weld repairs are permitted on yankee dryer pressure-retaining components manufactured from steel when properly evaluated and completed as described in NBIC Part 3.~~

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b)c) Structural deterioration or damage caused by corrosion, thinning, or cracking shall not be repaired until its extent has been determined by suitable nondestructive examination.

e)d) The user shall have a plan covering the scope of the repair. The plan shall ensure that the work involved is compatible with the original design specification and good engineering practices.

e)e) All repair work shall be documented.

S5.5 PROCEDURES THAT DO NOT REQUIRE STAMPING OR NAMEPLATE ATTACHMENT

All repair procedures shall be acceptable to the Inspector, and when verified by the owner-user to not affect pressure-retaining capability of the Yankee dryer, do not require stamping or nameplate attachment. Examples of repairs that do not require stamping or nameplate attachment are:

a) Grinding and machining:

1) ~~removal of shell overhung flange;~~

2) 1) removing bolt-stop ring for test specimens;

3) 2) head/shell joint corrosion removal;

4) 3) journal grinding;

5) 4) shell surface grinding (crowning);

6) 5) crack removal;

7) 6) head flange OD reduction during shell grinding; and

8) 7) back spot facing of flange surfaces (head, shell, journal).

b) Metallizing (full face, spot, edge):

1) applying a metallized coating; and

2) grinding of a metallized coating.

c) Epoxy (sealant) repair of steam leaks at bolted joints (using fittings and pumping bolts) and epoxy filling of surface imperfection;

d) Installation of spoiler bars;

e) Maintain/repair/replace internal condensate removal system;

f) Driven plug repair when completed as described in NBIC Part 3, S5.6.3; and

g) Threaded plug repair when completed as described in NBIC Part 3, S5.6.4.

h) Installation of head insulation

S5.6 DAMAGE REPAIR

S5.6.1 REPAIR OF LOCAL THINNING

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- a) A Local Thin Area (LTA) may develop in a pressure-retaining part or may result from the original ~~casting-manufacturing~~ process. Inservice thin areas may result from mechanical wear, erosion-corrosion caused by steam and condensate flow, corrosion, impact damage, or grinding for the removal of material flaws.
- b) Evaluation of thinning for repair shall consider the unique design and loading characteristics of the Yankee dryer. Local thin areas are often analyzed as specific cases by the finite element method.
 - 1) When a LTA is evaluated by finite element method, analysis should consider the location of the thin area and account for strength provided by the vessel center shaft and heads in addition to the strength provided by the shell alone. Such structural analysis should consider all relevant loads to ensure safe operation of the ~~shell according pressure vessel to the De-rate Curve, or other pressure-retaining parts as indicated on the original Manufacturer's Data Report.~~
 - 2) Following evaluation and determination of maximum allowable operating parameters, an LTA can be coated or filled to prevent further wear or deterioration. Grooves and gouges should always be lightly ground to remove sharp notches and edges. Welding or brazing repairs are NOT permitted on cast-iron pressure-retaining components.
 - 3) Where the LTA is of sufficient size to cause a reduction in maximum allowable operating parameters ~~according to the De-rate Curve,~~ an R-2 form shall be submitted.
 - 4) Depending upon the cause of the LTA, further monitoring may be necessary to ensure deterioration has been arrested.
 - 5) Inspection data, including all thickness readings and corresponding locations used to determine the minimum and average thicknesses, and the accompanying stress analysis, should be included in the documentation and retained for the life of the vessel.

S5.6.2 TREATMENT ASSESSMENT OF CRACK-LIKE FLAWS

- a) Crack-like flaws are planar flaws that are predominantly characterized by a length and depth with a sharp root radius. They may either be embedded or surface breaking. In some cases it may be advisable to treat volumetric flaws, such as aligned porosity, inclusions, and laps, as planar flaws, particularly when such volumetric flaws may contain microcracks at the root.
 - 1) Knowledge of local stress level and classification, and of flaw origin, type, size, location, and angle relative to the principal stress direction is essential in making determinations regarding remediation. It is also important to know whether the crack is active. Acoustic Emissions testing can be used to determine if the crack is active. Various other methods of nondestructive examination should be employed to determine crack length and depth. Ultrasonics is the recommended sizing technique for depth and inclination of crack-like flaws. Magnetic particle, specifically the wet fluorescent technique, and liquid penetrant methods are applicable in determining the length of a surface flaw. Radiographic and metallographic methods may also be useful. ~~Metallographic analysis is crucial in differentiating between original casting flaws and cracks.~~
 - 2) ~~Evaluation of crack-like flaws, that have been determined to be cracks is most often accomplished through removal via grinding or machining. Because cast iron is categorized as a brittle material, this is the conservative approach regarding crack-like flaws. Welding or brazing repairs are not permitted for cast-iron parts. Crack like flaws are most often removed via grinding or machining. Weld repairs are permitted in steel, but not in cast iron.~~ Metal-stitching is permitted as a repair. However this method of repair requires evaluation as to whether a reduction in allowable operating conditions is required. This evaluation shall be performed by the manufacturer or by another qualified source acceptable to the Inspector.

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- 3) Crack-like flaws that have been identified as cracks, but which developed from normal service exposure or excessive operating conditions, shall be remediated by appropriate means regardless of location.
 - 4) Crack-like flaws that have been identified as cracks that developed through non-standard load events, such as by water hoses from operation or firefighting or mechanical damage, shall be evaluated and remediated as necessary, if in the shell. ~~Cracks in other pressure-retaining parts shall be analyzed, documented, and monitored to ensure their presence will not be, or has not been, affected by current operating conditions.~~
 - 5) Crack-like flaws that are not identified as cracks, but which existed in the original material, i.e., material flaws, shall be analyzed, documented, and monitored to ensure their presence will not be, or have not been, affected by current operating conditions.
- b) All documents pertaining to ~~the~~ crack-like flaw assessment shall be retained for the life of the vessel. Documentation should address the engineering principles employed, including stress analysis methods and flaw sizing, the source of all material data used, identification of any potential material property degradation mechanisms and the associated influence on the propagation of flaw, and the criteria applied to the assessment procedures.

S5.6.3 DRIVEN PLUG REPAIR

Shell-Cast iron shell surface imperfections should-may be repaired with smooth, driven plugs as described in ASME Section VIII, Div. 1, UCI-78, with the following additional requirements:

- a) Maximum plug length (depth) shall be limited to 20% of shell effective thickness, and plug diameter shall not exceed the plug length (depth);
- b) Total surface area of plugs shall not exceed 4 sq. in. in an 8 in. diameter circle (2580 sq. mm in a 200 mm diameter circle);
- c) Average number of shell plugs shall not exceed 1 plug per 1 sq. ft. (1 plug per 0.1 sq. m) of the surface;
- d) The land distance between edges of plugs shall be at least equal to the diameter of the larger plug;
- e) The plug material shall conform in all respects to the material specification of the base material;
- f) The installed plug shall have an interference fit. The average hole diameter is determined after the plug hole is drilled or reamed. The maximum plug diameter shall not exceed 1.012 times the average hole diameter. This provides an interference fit while minimizing the residual stresses;
- g) All plug repair work shall be documented in the form of a plug repair map or other suitable method of recording and retained in the dryer's permanent file.

S5.6.4 THREADED PLUG REPAIR

Casting defects, leaks and local thin areas should-may be repaired with threaded plugs as described in ASME Section VIII, Division 1, UCI-78 with the additional requirement that a threaded plug shall not be used in an area subject to dynamic high frequency thermal/mechanical fatigue stresses-fatigue loading (e.g., Yankee dryer shell) as determined by the manufacturer or another qualified source acceptable to the Inspector.

S5.7 ALTERATIONS TO YANKEE DRYERS

2021 NBIC Part 3

S5.7.1 SCOPE

This supplement provides additional requirements for alterations to Yankee dryer pressure-retaining components and shall be used in conjunction with NBIC Part 3, Sections 2 through 5, as appropriate.

S5.7.2 ALTERATION TYPES

- a) Any change in the Yankee dryer (shell, heads, center shaft, ~~journals, manway covers,~~ fasteners), as described on the original *Manufacturer's Data Report*, which affects the pressure-retaining capability, shall be considered an alteration. Examples of alterations are:
 - 1) Drilling/enlarging of bolt holes ~~in castings~~ for larger diameter bolts;
 - 2) Replacement of structural bolts differing in size, material, or design, from those described on the *Manufacturer's Data Report*;
 - 3) Removal of shell overhung flange;
 - 4) Journal ~~outside diameter reduction to install a sleeve machining~~;
 - 5) Head flange outside diameter reduction;
 - 6) Machining of head flange or shell flange ~~surface mating surfaces~~ to remove corrosion; and
 - 7) ~~Changes to Operating above~~ the nameplate temperature.
- b) Alterations ~~to yankee dryers procedures shall be written, reviewed, approved, and shall be~~ accepted by the Inspector ~~and Jurisdiction when required~~ prior to the start of work.

Item 22-12: Lost or Destroyed UDS (Part 3, 3.3.5.2 & 3.4.5.1)

Explanation of Need: To provide the ability to repair/alter these vessels with a reconstructed UDS.

Background Information: This addition is based on the comments received at the task group level for Interpretation 21-60.

Proposed Changes:

3.3.5.2 REPAIR PLAN

The user shall prepare, or cause to have prepared, a detailed plan covering the scope of the repair.

a) Engineer Review and Certification

The repair plan shall be reviewed and certified by an engineer meeting the criteria of ASME Section VIII, Division 2 or 3, as applicable, for an engineer signing and certifying a Manufacturer's Design Report. The review and certification shall be such as to ensure the work involved in the repair is compatible with the User's Design Specification and the Manufacturer's Design Report. The certifying requirement may be waived for ASME Section VIII, Division 2, Class 1 vessels that did not require the Manufacturer's Design Report to be certified during initial construction.

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If the User's Design Specification (UDS) is lost or destroyed, the ASME nameplate, and the applicable ASME Section VIII, Division 2 and 3 forms Manufacturer's Data and Partial Data Reports shall be used to reconstruct the User's Design Specification such as Form A-1 Manufacturer's Data Report, Form A-2 Manufacturer's Partial Data Report for Section VIII, Division 2 vessels or Manufacturer's Data Reports for Section VIII, Division 3. The reconstructed UDS shall meet the requirements of ASME Section VIII, Division 2 or Division 3.

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Note: The engineer qualification criteria of the Jurisdiction where the pressure vessel is installed should be verified before selecting the certifying engineer.

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b) Authorized Inspection Agency Acceptance

Following review and certification, the repair plan shall be submitted for acceptance to the Authorized Inspection Agency/Owner-User Inspection Organization whose Inspector will make the acceptance inspection and sign the Form R-1.

3.4.5.1 ALTERATION PLAN

a) Engineer Review and Certification

The alteration plan shall be reviewed and certified by an engineer meeting the criteria of ASME Section VIII, Division 2 or 3, as applicable, for an engineer signing and certifying a Manufacturer's Design Report. The review and certification shall be such as to ensure the work involved in the alteration is compatible with the User's Design Specification and the Manufacturer's Design Report.

Provided that the alteration does not introduce a condition that would require an engineer to sign the Manufacturer's Design Report for ASME Section VIII, Division 2, Class 1 vessels, the certifying requirement may be waived for vessels that did not require the Manufacturer's Design Report to be certified during initial construction.

If the User's Design Specification (UDS) is lost or destroyed, the ASME nameplate, and the applicable ASME Section VIII, Division 2 and 3 forms Manufacturer's Data and Partial Data Reports shall be used to reconstruct the User's Design Specification such as Form A-1 Manufacturer's Data Report, Form A-2 Manufacturer's Partial Data Report for Section VIII, Division 2 vessels or Manufacturer's Data Reports for Section VIII, Division 3. The reconstructed UDS shall meet the requirements of ASME Section VIII, Division 2 or Division 3.

Note: The engineer qualification criteria of the jurisdiction where the pressure vessel is installed should be verified before selecting the certifying engineer.



PROPOSED REVISION OR ADDITION

Item No. A22-17
Subject/Title NBIC Part 3, S5.7.2, a), 1) and the examination methods of Part 3, 4.4.2, c)
Project Manager and Task Group Tim McBee-PM
Source (Name/Email) Steve Ayotte steve.ayotte@tuvsud.com
Statement of Need An additional examination option is needed for alterations performed to NBIC S5.7.2 a) 1).
Background Information When fasteners on dryers are no longer suitable for the intended service, an alteration may be performed by enlarging bolt holes to accept larger diameter bolts. This may be accomplished as a field alteration with the heads in place. Prior to performing the alteration, a finite element analysis (FEA) is performed to evaluate and approve stress levels and to ensure sufficient clamping to retain pressure. A thorough cleaning and visual inspection of enlarged holes and fastener seating surfaces are performed to verify no cracks or other indications. As there is only the removal of existing material by drilling and the original Code of Construction does not require NDE for the drilled holes, a visual inspection should be an acceptable examination. A liquid pressure test is generally not practicable.
Existing Text None
Proposed Text S5.7.3 Pressure testing of alterations shall be performed in accordance with NBIC Part 3, 4.4.2, and Part 2, S5.6. When enlarging bolt holes referenced in Part 3, S.5.7.2 a) 1), the item shall be visually examined and tested in accordance with the rules for repairs (see NBIC Part 3, 4.4.1).







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ENTRÉE INTERDITE SANS PERMIS
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PROPOSED REVISION OR ADDITION

Item No. A 22-18	
Subject/Title Definition of blowdown and blowoff	
NBIC Location Part: Installation & Pressure Relief Devices; Section: Section 9 & 9; Paragraph: 1 & 1	
Project Manager and Task Group Kathy Moore, Subcommittee Repairs/Alterations	
Source (Name/Email) Kathy Moore / kathymoore@joemoorecompany.com	
Statement of Need These terms are not consistently used throughout the industry. This is to provide guidance to use the correct term when addressing the equipment or the action.	
Background Information Gary Scribner is updating NB-27 which addresses this action and equipment. We want to have consistent terminology used for all NB documents. I will be glad to be the PM and present it to each group.	
Existing Text	Proposed Text Blowoff - the equipment and piping used when blowing down equipment such as boiler Blowdown - The act of releasing liquid, steam, or air with the purpose of removing solids or impurities from equipment

VOTE:							
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date



PROPOSED REVISION OR ADDITION

Item No. A 22-21	
Subject/Title Example of Alteration	
NBIC Location Part: Repairs and Alterations; Section: 3; Paragraph: 3.4.4 d)	
Project Manager and Task Group	
Source (Name/Email) Robert Underwood / robert_underwood@hsb.com	
Statement of Need A change in dimension of a pressure retaining item is not considered an alteration in many cases (increasing nozzle/tube thickness, increasing nozzle diameter in some cases...). This revision would provide clarity that only a change in dimension that decreases its pressure retaining capability be considered an alteration.	
Background Information This Code revision has been in the works with Item 21-12 for over a year, but due to delay in its approval we are creating a new Item to address 3.4.4 d) and also a corresponding intent interpretation.	
Existing Text 3.4.4 d) A change in the dimensions or contour of a pressure-retaining item;	Proposed Text d) A change in the dimensions or contour of a pressure-retaining item that decreases its pressure retaining capability;

COMMITTEE	VOTE:				Passed	Failed	Date
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