

Date Distributed:



*THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS*

NATIONAL BOARD INSPECTION CODE SUBGROUP PRESSURE RELIEF DEVICES

AGENDA

Meeting of January 14th, 2025
Charleston, SC

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

1. Call to Order

The Chair will call the meeting to order at 8:00 a.m. Eastern Time. For those attending in person, the meeting will be held in Grand Magnolia C on the second floor of the hotel.

2. Introduction of Members and Visitors

3. Check for Quorum

4. Announcements

- This meeting marks the end of Cycle A for the 2027 NBIC edition.
- The National Board will be hosting a reception on Wednesday evening from 5:30 p.m. to 7:30 p.m. at the Hyatt Place rooftop bar, the Pour Taproom.
- The National Board will be hosting breakfast and lunch on Thursday for those attending the Main Committee meeting. Breakfast will be served from 7:00 a.m. to 8:00 a.m. in Grand Magnolia Foyer, and lunch will be served from 11:30 a.m. to 12:30 p.m. in Sterling Hall Foyer.
- Meeting schedules, meeting room layouts, and other helpful information can be found on the National Board website under the **NBIC** tab → NBIC Meeting Information.
- The NBIC Committee has transitioned from NB File Share to SharePoint. Remember to add any attachments that you'd like to show during the meeting (proposals, reference documents, powerpoints, etc.) to the NBIC SharePoint site (nationalboard.sharepoint.com/sites/NBIC) **prior to the meeting**.
 - Note that access to the NBIC SharePoint site is limited to committee members only.
 - ALL powerpoint attachments/presentations must be sent to the NBIC Secretary for approval prior to the meeting.
 - Contact Jonathan Ellis (nbicsecretary@nbbi.org) for any questions regarding NBIC SharePoint access.
- When possible, please submit proposals in Word format showing “strike through/underline.” Project Managers: please ensure any proposals containing text from previous NBIC editions are updated with text from the most current edition.
- If you'd like to request a new Interpretation or Action item, do so on the National Board Business Center.
 - Anyone, member or not, can request a new item.
- As a reminder, anyone who would like to become a member of a group or committee:
 - Should attend at least two meetings prior to being put on the agenda for membership consideration. The nominee will be on the agenda for voting during their third meeting.
 - The nominee must submit the formal request along with their resume to the NBIC Secretary **PRIOR TO** the meeting. nbicsecretary@nbbi.org
 - If needed, we can also create a ballot for voting on a new member between meetings.
- Thank you to everyone who registered online for this meeting. The online registration is very helpful for planning our reception, meals, room setup, etc. It is also a good way to make sure we have the most up-to-date contact information. Please continue to use the online registration for each meeting.

5. Adoption of the Agenda

6. Approval of Minutes from the July 16, 2024, Meeting

The minutes are available for review on the National Board's website, on the Committee Information page under the NBIC tab.

7. Awards/Special Recognition

Mr. Alfred Donaldson – 5 years on SG PRD

Mr. Tom Tarbay – 5 years on SG PRD

8. Review of the Roster

a. Nominations

- i. Mr. Erik Heck and Mr. Billy DeKeyzer are interested in joining the subgroup.

b. Reappointments

c. Officer Nominations

d. Resignations

9. Items from Other Committees

a. R&A

- i. **Item 24-18** – Definition of Controlled Fill (P. Gilston as PM) (Attachment Page 1)

10. Interpretation Requests

| Item Number: 24-38 | NBIC Location: Part 4, 2.5.4.2 & Part 1, 3.9.1.6 c) | Attachment Page 2 |
|---|--|--------------------------|
| General Description: T&P relief device installation on modular HWH supply header | | |
| Task Group: None assigned. | | |
| Explanation of Need: The NBIC does not address the installation or location of a common T&P valve for modular HWH's. Clarification is needed on whether the common supply header can be considered part of the HWH, and whether T&P valves can be installed in the horizontal position with the outlet pointed down, if installed directly to the header with no more than 4 in. maximum interconnecting piping. | | |
| July 2024 Meeting Action: The proposed question was revised, however, SG Installation stated that modular HWHs are not currently addressed by NBIC and opened action item A24-26. This item cannot move forward until A24-26 is approved. | | |

| Item Number: 24-46 | NBIC Location: Part 4, 4.3.1 a) | Attachment Page 3 |
|---|--|--------------------------|
| General Description: Replacement of Bodies and Transfer of Nameplates During Repair | | |
| Task Group: None assigned. | | |
| Explanation of Need: Clarity on what defines "the valve". Is "the valve" the nameplate solely or the nameplate and serialized base; and subsequent ability to divorce the nameplate and base during repair when the base requires replacement. | | |
| July 2024 Meeting Action: A proposed question and response was presented. This is an intent interpretation. Item 24-72 was opened in response to this interpretation request and a task group was assigned. This cannot move forward until Item 24-72 is approved. | | |

New Interpretation Requests:

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|--|---|--------------------------|
| Item Number: 24-87 | NBIC Location: Part 4, 4.7.3 a) and b) | Attachment Page 4 |
| General Description: Changes to the original pressure relief device nameplate. | | |
| Task Group: None assigned. | | |
| Explanation of Need: Clarification is needed on the correct way to communicate changes to a relief device through nameplate stamping. | | |
| January 2025 Meeting Action: | | |

11. Action Items

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|--|------------------------------|----------------------|
| Item Number: NB15-0305 | NBIC Location: Part 4 | No Attachment |
| General Description: Create Guidelines for Installation of Overpressure Protection by System Design. | | |
| Task Group: B. Nutter, A. Renaldo, D. Marek (PM), D. DeMichael, J. Wolf, D. Schirmer, J. Grace, D. Sullivan | | |
| July 2024 Meeting Action: Progress report. Work continues on this item. | | |

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|--|---|----------------------|
| Item Number: NB15-0315 | NBIC Location: Part 4, 2.5.6 and 2.6.6 and Part 1, 4.5.6 and 5.3.6 | No Attachment |
| General Description: Review isolation Valve Requirements, and reword to allow installation of pressure relief devices in upstream piping. | | |
| Task Group: D. DeMichael (PM), B. Nutter, A. Renaldo, D. Marek, K. Beise | | |
| July 2024 Meeting Action: Progress report. Work continues on this item. | | |

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|--|--------------------------------------|----------------------|
| Item Number: 19-83 | NBIC Location: Part 4, Part 1 | No Attachment |
| General Description: Address alternate pressure relief valve mounting permitted by ASME CC2887-1. | | |
| Task Group: D. Marek (PM), T. Patel, J. Ball | | |
| July 2024 Meeting Action: Progress report. Work continues on this item. | | |

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|--|------------------------------------|----------------------|
| Item Number: 21-08 | NBIC Location: Part 4, S4.4 | No attachment |
| <p>General Description: Additional guidance for tank vent repairs</p> <p>Subgroup: PRD</p> <p>Task Group: D. DeMichael (PM), H. Cornett, B. Nutter, K. Beise, J. Grace</p> <p>Explanation of Need: The recently approved S4.4, "Weight Loaded Vents," (NB12-0901) provided new guidance for tank vent repairs. Several additional topics need to be addressed to enhance the guidance. These topics include: 1) Suggested test equipment and configuration for the prescribed tank vent testing. 2) Minimum requirements for replacement parts, 3) Guidance for painting tank vent components.</p> <p>July 2024 Meeting Action: Progress report. Work continues on this item.</p> | | |

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|---|-------------------------------------|----------------------|
| Item Number: 22-09 | NBIC Location: Part 4, 4.6.1 | No Attachment |
| <p>General Description: Add language to NBIC Part 4 for valves manufactured to Code Case 2787</p> <p>Subgroup: PRD</p> <p>Task Group: A. Donaldson (PM), H. Cornett, B. Nutter, T. Tarbay, J. Simms</p> <p>Explanation of Need: There are no requirements to address valve repairs that were manufactured or assembled to Code Case 2787 (use of more than one certified capacity on the pressure relief valve or the nameplate).</p> <p>July 2024 Meeting Action: Progress report. Work continues on this item.</p> | | |

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|---|-------------------------------------|----------------------|
| Item Number: 22-20 | NBIC Location: Part 4, 4.7.4 | No Attachment |
| <p>General Description: Inspection and testing of PRV's located above isolation valves.</p> <p>Subgroup: PRD</p> <p>Task Group: D. Marek (PM), K. Beise, J. Ball, E. Creaser, H. Cornett, A. Renaldo</p> <p>Explanation of Need: Add requirement to make sure the internals of a PRV inlet and outlet are inspected when it is tested, and require tests to be done with a pressure vessel with volume.</p> <p>July 2024 Meeting Action: Progress report. Work continues on this item.</p> | | |

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|--|---|----------------------|
| Item Number: 23-32 | NBIC Location: Part 4, 3.3 and Supp. 6 | No Attachment |
| <p>General Description: Rules for T/O activities related to Nuclear Class Valves</p> <p>Subgroup: PRD</p> <p>Task Group: E. Creaser (PM), P. Dhobi, D. McHugh, J. Simms</p> <p>Explanation of Need: Nuclear facilities that perform repair and T/O activities would by allowing them to use T/O for nuclear class valves that were serviced but not in need of repair but need to be set and sealed again.</p> <p>July 2024 Meeting Action: Progress report. Work continues on this item.</p> | | |

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|--|-------------------------------------|--------------------------|
| Item Number: 24-35 | NBIC Location: Part 4, 4.6.2 | Attachment Page 5 |
| <p>General Description: Update Testing of UV-Designated Steam valves on Air to match ASME XIII</p> <p>Subgroup: PRD</p> <p>Task Group: None assigned.</p> <p>Explanation of Need: ASME Section XIII Table 3.6.3.1-1 Note 3 permits UV-designated steam valves to be tested using air when the valve is beyond the testing capabilities due to set pressure or capacity. The NBIC only permits steam valves to be tested on air by the owner/user. This should be permitted by any VR shop that has steam test equipment since it is permitted under the rules for new construction.</p> <p>July 2024 Meeting Action: A proposal was presented. The proposal will be sent to letter ballot.</p> <p>NOTE: This item was approved by the subgroup via letter ballot on November 16, 2024.</p> | | |

12. New Business

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|--|-------------------------------------|----------------------|
| Item Number: 24-72 | NBIC Location: Part 4, 4.3.1 | No Attachment |
| <p>General Description: Add Language to Address Replacement of Valve Bodies and Bases</p> <p>Subgroup: PRD</p> <p>Task Group: None assigned.</p> <p>Explanation of Need: Under the current text of 4.3.1 there are no guidelines for the replacement of valve components to which the original nameplate is attached.</p> <p>January 2025 Meeting Action:</p> | | |

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|--|-------------------------------------|--------------------------|
| Item Number: 24-91 | NBIC Location: Part 4, 3.2.3 | Attachment Page 6 |
| <p>General Description: Require means to prevent safety valve discharge piping blockage for LCDSV (Part 4)</p> <p>Subgroup: PRD</p> <p>Task Group: None assigned.</p> <p>Explanation of Need: Adding verbiage to the NBIC Part 1, Part 2 and Part 4 to require a means to prevent foreign material introduction to the safety valve discharge pipe.</p> <p>January 2025 Meeting Action:</p> | | |

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|--|--|--------------------------|
| Item Number: 24-101 | NBIC Location: Part 4, Sections 3 and 4 | Attachment Page 7 |
| <p>General Description: Revise NBIC to expand VR and T/O programs beyond ASME Certified Valves</p> <p>Subgroup: PRD</p> <p>Task Group: None assigned.</p> <p>Explanation of Need: The National Board upper management and Board of Trustees have decided to expand the VR and T/O programs to valves that are constructed to standards other than ASME. The proposal file contains changes that would accomplish this goal. Changes to NB-514 and NB-528 will follow.</p> <p>January 2025 Meeting Action:</p> | | |

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|---|--|---------------------------|
| Item Number: 24-103 | NBIC Location: Part 4, S4.3 f) and S7.2 a) 2) | Attachment Page 26 |
| <p>General Description: Sealing and Tagging of Pilot operated relief valve under VR Program</p> <p>Subgroup: PRD</p> <p>Task Group: None assigned.</p> <p>Explanation of Need: The need for the above change is to have a way to ensure that both the pilot and main valve have been repaired to the requirements of NBIC during the same repair. Currently it is difficult to identify if both components have been repaired during the same repair. This makes it challenging under the T/O program to verify this required information. Additionally, under the current code there is the possibility for a non-accredited repair organization to change the pilot with a set and tested pilot which would have seals and repair the main without disturbing the seals. The previous VR tag would be intact as well as the seals upon completion.</p> <p>January 2025 Meeting Action:</p> | | |

13. Presentations

14. Future Meetings

- July 7-10, 2025 – Cincinnati, OH
- January 12-15, 2026 – New Orleans, LA

15. Adjournment

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'R. Viers', with a stylized flourish at the end.

Robert Viers
Secretary, Subgroup Pressure Relief Devices




THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS

PROPOSED REVISION OR ADDITION


| | | |
|---|---|--|
| Item No. A 24-18 Rev 01 | | |
| Subject/Title Controlled Fill Definition | | |
| NBIC Location All Parts, Section 9, Glossary of Terms | | |
| Project Manager and Task Group Philip Gilston (PM), A. Triplett | | |
| Source (Name/email) Philip Gilston (philip_gilston@hsb.com) | | |
| Statement of Need There is no definition of the term 'controlled fill'. | | |
| Background Information <p>Interpretation item I 23-79 addresses the use of the term 'controlled fill' in NBIC Part 3, 2.5.3 d in relation to Welding Method 6 for Grade 91 material.</p> <p>While the term 'controlled fill' is not specifically used in the text of Welding Method 6 (2.5.3.6), directions are given for such variables as typical preheats, electrode size for SMAW, and the use of stringer beads only. The term is used explicitly in Supplement 8 for CSEF repairs, where S8.3.b says that "To control heat input the weld repair shall be performed using a "controlled fill" technique"; details are also given on such items as preheats, electrode size, required fill pass overlap, etc., and a lot of detail is provided in schematics including specifics on weld bead placement.</p> | | |
| Existing Text None | Proposed Text <u>Changes form Rev 00 shown</u> Controlled Fill – requirements specified <u>control of weld technique</u> for a permitted weld repair process in order to manage heat input to ensure <u>satisfactory weld properties by controlling distortion, promoting tempering and minimizing the risk of cracking by</u> addressing variables including but not limited to heat input, such as preheat and interpass temperature, weld consumable type and diametersize <u>weld technique</u> (string or weave); and bead placement etc. | Clean Copy Controlled Fill – control of weld technique for a repair process to ensure satisfactory weld properties by controlling distortion, promoting tempering and minimizing the risk of cracking by addressing variables including but not limited to heat input, preheat and interpass temperature, weld consumable type and size, weld technique (string or weave) and bead placement. |

| VOTE | | | | | | | |
|-----------|----------|-------------|-----------|------------|--------|--------|------|
| Committee | Approved | Disapproved | Abstained | Not Voting | Passed | Failed | Date |
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PROPOSED INTERPRETATION

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| Item No. 24-38 |  <div style="display: inline-block; vertical-align: middle; text-align: left;"> THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS </div> |
| Subject/Title | T&P relief device installation on modular HWH supply header |
| Project Manager and Task Group | |
| Source (Name/Email) | Terrence Hellman / thellman@nationalboard.org |
| Statement of Need | The NBIC does not address the installation or location of a common T&P valve for modular HWH's. Clarification is needed on whether the common supply header can be considered part of the HWH, and whether T&P valves can be installed in the horizontal position with the outlet pointed down, if installed directly to the header with no more than 4 in. maximum interconnecting piping. |
| Background Information | ASME Section IV, Article 9 addresses Modular Water Heater Requirements, and allows for multiple units to be certified as a single water heater with a single pressure relief valve on the supply header per HLW-903(g)(1). NBIC does not address the installation or location of a common T&P valve for modular HWH's. |
| Proposed Question | For an assembled modular water heater certified as a single water heater, with the temperature and pressure relief device located on the supply header as permitted in ASME Sect. IV, para. HLW-903(g)(1), may it be installed in the horizontal position with the outlet pointed down as allowed in NBIC Part 1, 3.9.1.6 c), 3.9.4.2, and Part 4, 2.5.4.2? |
| Proposed Reply | Yes. |
| Committee's Question 1 | For an assembled modular water heater certified as a single water heater, with the temperature and pressure relief device located on the supply (i.e. distribution) header, may it be installed in the horizontal position with the outlet pointed down as allowed in NBIC Part 1, 3.9.1.6 c), 3.9.4.2, and Part 4, 2.5.1.6 c) 4.2? |
| Committee's Reply 1 | Yes. |
| Rationale | <u>Part 1, 3.9.1, 3.9.4.2, and Part 4 2.5.1 do not exclude modular design. The term supply header is defined as distribution from the heater in ASME Sec IV. It is not intended to refer to the cold water inlet supply.</u> |
| Committee's Question 2 | |
| Committee's Reply 2 | |
| Rationale | |

PROPOSED INTERPRETATION

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| Item No. 24-46 |  THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS |
| Subject/Title Replacement of Bodies and Transfer of Nameplates During Repair | |
| Project Manager and Task Group | |
| Source (Name/Email) Benjamin Atwell / Ben.Atwell@puffer.com | |
| Statement of Need Clarity on what defines "the valve". Is "the valve" the nameplate solely or the nameplate and serialized base; and subsequent ability to divorce the nameplate and base during repair when the base requires replacement. | |
| Background Information We on occasion run into issues where a body needs replaced and lead time on a new valve drives necessity. Since the body carries the manufacturer/assembler nameplate with the Code stamp and is the serialized part of the valve it could be viewed as "the valve". Replacing the base would require transferring the original nameplates to the new body, grinding off any serial numbers on the new body, and restamping/etching the new body with the original serial number. Driving factor for this question is the discussion around what distinguish "the valve". If replacement of bodies and transfer of nameplates is acceptable it leads to the hypothetical situation where all or nearly all parts in a valve could be replaced with new components. Effectively replacing a valve with a "new valve" and circumventing the assembler requirements per ASME as the original nameplate carries a valid code stamp and now lives on the "new valve". | |
| Proposed Question Is it permissible to replace the body of a valve during a repair and transfer the nameplate from the original body to the new body? | |
| Proposed Reply Yes or no on ability to transfer a nameplate to a new base and adopt all markings/code stamps onto the new base. | |
| Committee's Question 1 Is it permissible to replace the body of a valve during a repair and transfer the nameplate from the original body to the new body? | |
| Committee's Reply 1 Yes | |
| Rationale Under the current text of Part 4, 4.3.1, this activity is not prohibited. | |
| Committee's Question 2 | |
| Committee's Reply 2 | |
| Rationale | |



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

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| Subject: | Changes to the original pressure relief device nameplate. |
| NBIC Location: | 2023 NBIC Part 4, 4.7.3 a) and b) |
| Statement of Need: | Clarification is needed on the correct way to communicate changes to a relief device through nameplate stamping. |
| Background Information: | A VR certificate holder has been audited and has received corrective actions for only stamping out the items of a relief device's part number that have been changed. The shop was given guidance to update their quality control manual to stamp out the entire part number even when not all components have been changed. |
| Proposed Question: | Part 4, paragraph 4.7.3 (a) second sentence states “For these repairs, the invalidated information on the original nameplate or stamping shall be marked out but left legible.” Is the invalidated information considered the to be the entire field (for example entire model number or only a portion of model number)? |
| Proposed Reply: | No. Only the portion that is invalidated shall be marked out but left legible. However, the entire new model number shall be marked on the VR nameplate. |
| Committee’s Question: | <Question(s) the committee will interpret. Can be the same wording as the proposed question> |
| Committee’s Reply: | <Yes or no response> |
| Rationale: | <Additional clarification for response> |

ITEM 24-35 Proposal 3/25/24 based on previously approved changes

4.6.2 ~~OWNER-USER~~ TESTING OF ASME “UV” DESIGNATED STEAM SERVICE VALVES USING AIR

~~When ASME “UV” designated steam valves may be tested with air by the VR Certificate Holder provided either, the valve to be tested is beyond the capabilities of the qualified steam test equipment due to size or set pressure, or the valve to be tested is repaired by the owner for the owner’s own use and the following conditions are met:~~
~~are repaired by the owner for the owner’s own use, valves for steam service may be tested on air for set pressure and, if possible, blowdown adjustment, provided the valve manufacturer’s corrections for differential in set pressure between steam and air are applied to determine the test pressure as follows:~~

a) The test pressure using air as the test medium shall be the product of the Manufacturer’s correction factor for the differential between steam and air multiplied by the set pressure. If a cold differential test pressure is applicable due to superimposed back pressure and/or service temperature, then the manufacturer’s correction factor shall be applied to the cold differential test pressure. The test pressure shall be recorded on the valve repair document described in 4.8.5.4 i).

b) The correction factor between steam and air shall not be included in the cold differential test pressure marked on the valve repair nameplate per 4.7.2 b) 8).

For reference only below are changes that were approved by voice vote at MC at the January 2023 meeting.

ITEM 22-35 1/10/23

4.6.2 OWNER-USER ~~ASME CODE SECTION VIII STEAM~~ TESTING OF ASME “UV” DESIGNATED STEAM SERVICE VALVES

When ASME ~~Code Section VIII “UV” designated~~ valves are repaired by the owner for the owner’s own use, valves for steam service may be tested on air for set pressure and, if possible, blowdown adjustment, provided the valve manufacturer’s corrections for differential in set pressure between steam and air are applied to determine the test pressure as follows:

Staff editorial note: Table of Contents will need to be updated



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

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|--------------------------------|--|
| Subject: | Require means to prevent safety valve discharge piping blockage for LCDSV (Part 4) |
| NBIC Location: | 2023 NBIC, Part 4, 3.2.3 |
| Statement of Need: | Adding verbiage to the NBIC Part 1, Part 2 and Part 4 to require a means to prevent foreign material introduction to the safety valve discharge pipe. |
| Background Information: | Inspection of CO2 tanks (bulk liquid carbon dioxide storage vessels LCDSV) has shown some areas of the country where insects have built nests in the discharge piping of the safety valve. Once the vessel reaches 300 psi and the safety valve should begin venting, product flow is fully blocked and cannot vent the vessel pressure. In some instances, the pressure has been found to be as high as 350 psi while safety valve outlet discharge is fully restricted. (The vessel MAWP in this example was 300 psi.) An example is dirt dobber bees can block the discharge line and pushing an ink pen through the dirt will allow for sudden venting of the vessel's built-up pressure. The sudden burst of flow from the discharge does present a potential hazard. |

Proposed Text:

3.2.3 INSPECTION REQUIREMENTS FOR INSTALLATION CONDITION

k) All safety relief/vent line discharge shall be protected to prevent stoppage of the lines by foreign material, moisture, or insects.

3.2.5.1 TESTING AND OPERATIONAL INSPECTION OF PRESSURE RELIEF VALVES

(23)

In addition to the requirements of 3.2.5, the following apply to testing and operational inspection of pressure relief valves.

- a) Pressure relief valves shall be tested periodically to ensure that they are free to operate and will operate in accordance with the requirements of the original code of construction. Testing should include device set or opening pressure, reclosing pressure (where applicable), and seat leakage evaluation. Tolerances for these operating requirements specified in the original code of construction shall be used to determine the acceptability of test results.
- b) Valves may be tested using lift assist devices when testing at full pressure may cause damage to the valve being tested or when it is impractical to test at full pressure due to system design considerations. Lift assist devices apply an auxiliary load to the valve spindle or stem, and using the measured inlet pressure, applied load and other valve data allow the set pressure to be calculated. If a lift assist device is used to determine valve set pressure, the conditions of 4.6.3 shall be met. It should be noted that false set pressure readings may be obtained for valves which are leaking excessively or otherwise damaged.
- c) If valves are not tested on the system using the system fluid, the test media specified in the original code of construction shall be used. ~~following test mediums shall be used:~~
 - ~~1) High pressure boiler pressure relief valves, high temperature hot water boiler pressure relief valves, low pressure steam heating boilers: steam;~~
 - ~~2) Hot water heating boiler pressure relief valves: steam, air, or water;~~
 - ~~3) Hot water heater temperature and pressure relief valves: air or water;~~
 - ~~4) Air and gas service process pressure relief valves: air, nitrogen, or other suitable gas;~~
 - ~~5) Liquid service process pressure relief valves: water or other suitable fluid; and~~
 - ~~6) Process steam service pressure relief valves: steam or air with manufacturer's steam to air correction factor.~~

Note: Valves being tested after a repair must be tested on steam except as permitted by 4.6.2.

- d) As an alternative to a pressure test, the owner may check the valve for freedom of operation by activating the test or "try" lever (i.e., manual check). For high pressure boiler and process valves, this test should be performed only at a pressure greater than 75% of the stamped set pressure of the valve or the lifting device may be damaged. This test will only indicate that the valve is free to operate and does not provide any information on the actual set pressure. All manual checks should be performed with some pressure under the valve in order to flush out from the seat debris that could cause leakage.

Note: The manual check at 75% or higher is based on lift lever design requirements for ASME Section I and VIII valves. Code design requirements for lifting levers for Section IV valves require that the valve is capable of being lifted without pressure. If the valve is constructed using a standard other than ASME then that standard shall be followed.

- e) Systems with multiple valves will require the lower set valves to be held closed to permit the higher set valves to be tested. A test clamp or "gag" should be used for this purpose. The spring compression screw shall not be tightened. It is recommended that when the valve is at or near the test temperature, the test clamps are applied in accordance with the valve manufacturer's instructions; application should be hand-tight only to avoid damage to the valve stem or spindle.
- f) Upon completion of set pressure testing, all pressure relief valve gags shall be removed. Any stop valves used to isolate lower set pressure relief devices shall be reopened (and locked, if applicable).

3.3 ACCREDITATION OF “T/O” TEST ONLY ORGANIZATIONS

(23) 3.3.1 SCOPE

- a) This section provides requirements that must be met for an organization to obtain a National Board *Certificate of Authorization* to use the “T/O” Certification Mark for in-service testing and performing minor adjustments of pressure relief valves constructed in accordance with the requirements of the original code of construction ASME Code.
- b) For administrative requirements to obtain or renew a National Board “T/O” *Certificate of Authorization* and “T/O” Certification Mark, refer to NB-528, Accreditation of “T/O” Test Only Organizations.
- c) Authorization to use the official National Board “T/O” Certification Mark as shown in Figure 3.3.6.2-a), will be granted by the National Board provided the requirements of the administrative rules in NB-528 and the NBIC are met.

3.3.2 JURISDICTIONAL PARTICIPATION

The National Board member Jurisdiction in which the “T/O” organization is located is encouraged to participate in the review and demonstration of the applicant’s quality system. The Jurisdiction may require participation in the review of the testing organization and the demonstration and acceptance of the repair organization’s quality system manual.

3.3.3 QUALITY SYSTEM

3.3.3.1 GENERAL

Each applicant for a new or renewed “T/O” *Certificate of Authorization* shall have and maintain a Quality System which shall establish compliance with all of these rules, administrative procedures, and ~~applicable ASME Code~~ requirements of the applicable code of construction, including testing, inspection, sealing, and application of the “T/O” Certification Mark.

3.3.3.2 WRITTEN DESCRIPTION

A written description, in the English language, of the system the applicant will use shall be available for review and shall contain, as a minimum, the features set forth in 3.3.3.4. This description may be brief or voluminous, depending upon the projected scope of work, and shall be treated confidentially. In general, the quality system shall describe and explain what documents and procedures the testing firm will use to validate a test and/or minor adjustment.

3.3.3.3 MAINTENANCE OF A CONTROLLED COPY

Each applicant to whom a “T/O” *Certificate of Authorization* is issued shall maintain thereafter a controlled copy of the accepted quality system manual with the National Board. Except for changes that do not affect the quality system, revisions to the quality system manual shall not be implemented until such revisions are accepted by the National Board.

(23) 3.3.3.4 OUTLINE OF REQUIREMENTS FOR A QUALITY SYSTEM

The following establishes the minimum requirements of the written description of the quality system. It is required that each testing organization develop its own quality system that meets the requirements of its organization. For this reason it is not possible to develop one quality system that could apply to more than one organization. The written description shall include, as a minimum, the following features:

a) Title Page

The title page shall include the name and address of the company to which the National Board *Certificate of Authorization* is to be issued.

b) Revision Log

A revision log is required to ensure revision control of the quality system manual. The log should contain sufficient space for date, description and section of revision, company approval, and National Board acceptance.

c) Contents Page

The contents page should list and reference, by section paragraph or page number, the subjects and exhibits contained therein.

d) Statement of Authority and Responsibility

A statement of authority and responsibility shall be dated and signed by an officer of the company. It shall include:

- 1) A statement that the "T/O" Certification Mark shall be used only for pressure relief valves that meet the following conditions:
 - a) ~~Constructed to a published standard and if applicable, marked accordingly. Are marked with an ASME "V", "UV", or "HV" Code symbol or marked with the ASME Certification Mark with "V", "UV", or "HV" designator and have been capacity certified by the National Board;~~
 - b) Have been visually inspected, and successfully tested in accordance with this program; and
 - c) Only external adjustments to restore the nameplate set pressure and/or performance of a pressure relief valve shall be made under the provisions of this program. If disassembly, change of set pressure, or additional repairs are necessary, the valve shall be repaired by a National Board "VR" Certificate Holder or replaced.
- 2) The title of the individual responsible for ensuring that the quality system is followed and who has authority and freedom to affect the responsibility;
- 3) A statement that if there is a disagreement in the implementation of the written quality system, the matter is to be referred to a higher authority in the company for resolution; and
- 4) The title of the individual authorized to approve revisions to the written quality system and the method by which such revisions are to be submitted to and accepted by the National Board before implementation.

e) Organization Chart

A chart showing the relationship between management, inspection, testing, and quality control personnel is required and shall reflect the actual organization in place.

f) Scope of Work

- 1) The scope of work section shall indicate the scope and type of valve testing the organization is capable of and intends to perform. The location of testing (shop, shop and field, or field only), ~~ASME Code Section(s)~~ construction codes or requirements to which the tests apply, and the test medium (air, gas, liquid, or steam, or combinations thereof) shall be included.
- 2) The types and sizes of valves to be tested, pressure ranges and other limitations shall also be addressed.

g) Specification Control

The specification control system shall provide procedures assuring that the latest applicable specifications and instructions required are used for valve inspection and testing.

h) Inspection and Testing Program

The inspection and testing program section shall include reference to a document (such as an inspection and test report, or checklist) that outlines the specific inspection and testing procedures used in the testing of pressure relief valves. Provisions shall be made to retain this document for a period of at least five years.

- 1) Each valve or group of valves shall be accompanied by the document referred to above for processing through the plant. Each valve shall have a unique identifier assigned by the Test Only organization (e.g., job serial number, shop order number, work order number, etc.) appearing on the test documentation and test only nameplate such that traceability is established.
- 2) The document referred to above shall describe the original nameplate information, including ~~any marking required by the original code of construction the ASME Code symbol stamping~~ and, if applicable, the repair nameplate information. In addition, it shall include pressure test methods to be used. Application of the "T/O" Certification Mark to the test only nameplate shall be recorded in this document. There shall be a space for "signoffs" at each operation to verify that each step has been properly performed by qualified personnel.
- 3) The system shall also describe the controls used to ensure that any personnel engaged in the testing of pressure relief valves are trained and qualified in accordance with 3.3.5.

i) Valve Adjustment and Sealing

- 1) The system shall include provisions that each pressure relief valve requiring adjustment as permitted by 3.2.5.5 shall have existing seal(s) removed only for the required adjustment(s), be tested, set, and external adjustment(s) re-sealed according to the requirements of the applicable ~~ASME Code Section code of construction~~ and the NBIC. The seal shall identify the "T/O" Certificate Holder performing the test or making the adjustment. Abbreviations or initials are permitted, provided such identification is defined in the quality system and acceptable to the National Board.
- 2) The system shall include provisions that each pressure relief valve requiring the use of a Lift Assist Device for testing as permitted by 3.2.5 c) may have the seal(s) removed for testing. Upon completion of testing, external adjustments shall be re-sealed in accordance with i) 1) above.

j) Test Only Nameplates

The quality system shall include a description of a nameplate or a drawing. An effective valve marking system shall be established to ensure proper marking and nameplate attachment for each valve as required by 3.3.6.2. The manual shall include a description of the nameplate or a drawing.

k) Calibration

- 1) The quality system shall describe a system for the calibration of examination, measuring, and test equipment used in the performance of testing. Documentation of these calibrations shall include the standard used and the results.
- 2) All calibration standards shall be calibrated against certified equipment having known valid relationships to nationally recognized standards.

l) Manual Control/Procedures

The quality system manual and referenced procedures shall include:

- 1) Measures to control the issuance of and revisions to the quality system manual;

- 2) Provisions for a review of the system in order to maintain the manual current with these rules and the applicable ~~sections of the ASME Code~~code of construction;
- 3) The title(s) of the individual(s) responsible for preparation, revision distribution, approval, and implementation of the quality system manual;
- 4) Provision for a controlled copy of the accepted written quality system manual to be submitted to the National Board; and
- 5) Revisions shall be submitted to and accepted by the National Board prior to being implemented.

m) Nonconformities

The quality system shall establish measures for the identification, documentation, evaluation, segregation, and disposition of nonconformities. A nonconformity is a condition of any material, item, product, or process in which one or more characteristics do not conform to the established requirements. These may include, but are not limited to, data discrepancies, procedural and/or documentation deficiencies, or material defects. Also, the title(s) of the individual(s) involved in this process shall be included.

n) Testing Equipment (See NBIC Part 4, Supplement 5)

The quality system shall include a means to control the development, addition, or modification of testing equipment to ensure the requirements of NBIC Part 4, 4.6.1 b) are met.

o) Field Testing

If field testing is included in the scope of work, the system shall address any differences or additions to the quality system required to properly control this activity, including the following:

- 1) Provisions for annual audits of field activities shall be included;
- 2) Provisions for use of owner-user measurement and test equipment, if applicable, shall be addressed.

p) Records Retention

The quality manual shall describe a system for filing, maintaining, and easily retrieving records supporting or substantiating the administration of the Quality System within the scope of the "T/O" *Certificate of Authorization*. The record retention schedule described in the Quality System Manual is to follow the instructions identified in Table 3.3.3.4 p).

q) Exhibits

Forms used in the quality system shall be included in the manual with a written description. Forms exhibited should be marked "SAMPLE" and completed in a manner typical of actual valve testing procedures.

TABLE 3.3.3.4 p)

| Reports, Records, or Documents for "T/O" Certificate Holders | Instructions | Minimum Retention Period |
|--|---|--|
| a) Record of testing or inspection | The testing and inspection program section shall include reference to a document (such as a report, traveler, or checklist) that outlines the specific testing and inspection procedures used in the testing of pressure relief valves. | 5 years |
| b) Records related to equipment qualification and instrument calibration | Prior to use, all performance testing equipment shall be qualified by the certificate holder to ensure that the equipment and testing procedures will provide accurate results when used within the ranges established for that equipment. This qualification may be accomplished by benchmark testing, comparisons to equipment used for verification testing as specified in the quality system, or comparisons to field performance. | 5 years after the subject piece of equipment or instrument is retired. |
| c) Record of lift assist device qualification | Prior to use, all lift assist devices shall be qualified by the certificate holder to ensure that the equipment and testing procedures will provide accurate results when used within the ranges established for that equipment used for verification testing as specified in the quality system or comparisons to field performance. This qualification shall be documented. | 5 years after the lift assist device is retired. |
| d) Records of employee training and qualification | Each testing organization shall establish minimum qualification requirements for those positions within the organization as they directly relate to pressure relief valve testing. Each testing organization shall document the evaluation and acceptance of an individual's qualification for the applicable position. | 5 years after termination of employment. |

3.3.4 TESTING & ADJUSTMENT

- a) Each Pressure Relief Valve to be tested shall be inspected in accordance with Section 3.2.2.
- b) Pressure Relief Valves with missing or illegible nameplates shall not be tested under the T/O program and shall be referred to a "VR" Certificate Holder or replaced.
- c) Pressure Relief Valves shall be tested to confirm that the Set Pressure (defined as the average of at least three consecutive tests) is within the allowable tolerance specified by the ~~applicable ASME Code Section~~applicable code of construction and NBIC. Test Results, including Test Gauge Identification, shall be recorded on the document referred to above. Pressure Relief Valve seals shall not be removed unless required for adjustment or testing using a lift assist device.

- d) Testing organizations may obtain a “T/O” *Certificate of Authorization* for field testing, either as an extension to their in-shop/plant scope, or as a field-only scope, provided that the Quality System includes the following provisions:
- 1) Qualified technicians in the employ of the certificate holder perform such testing;
 - 2) An acceptable quality system covering field testing, including field audits is maintained; and
 - 3) Functions affecting the quality of the tested valves are supervised from the address of record where the “T/O” certification is issued.

3.3.4.1 AUDIT REQUIREMENTS

Upon issuance of a *Certificate of Authorization*, provided field tests are performed, annual audits of the work carried out in the field shall be performed to ensure that the requirements of the certificate holder’s quality system are met. The audit shall include, but not be limited to, performance testing, in accordance with paragraph 4.6, of valve(s) that were tested in the field. The audits shall be documented.

3.3.5 COMPETENCY, TRAINING AND QUALIFICATION OF PERSONNEL (23)

3.3.5.1 COMPETENCY OF PERSONNEL (23)

The test organization shall establish the skills, knowledge, competencies, and method to evaluate competencies required for each position within the organization having direct effect on the quality of pressure relief valve testing and adjustment performed in accordance with the Certificate of Authorization.

3.3.5.2 CONTENTS OF TRAINING PROGRAM (23)

The test organization shall establish a documented training program to ensure the defined skills, knowledge and competencies are achieved. As a minimum, training objectives for each position shall include:

- a) ~~Applicable ASME Code~~ Requirements of the applicable code of construction;
- b) Applicable NBIC requirements;
- c) Individual responsibilities of each function described within the organization’s quality system;
- d) Technical aspects for the applicable position held; and
- e) Mechanical skills for applicable position held.

3.3.5.3 INITIAL EVALUATION AND ACCEPTANCE OF PERSONNEL (23)

The test organization shall complete an initial evaluation and acceptance of each individual’s skills and competency prior to the individual being assigned to work without direct supervision. This evaluation and acceptance shall be documented.

3.3.5.4 ANNUAL EVALUATION AND ACCEPTANCE OF PERSONNEL (23)

The test organization shall complete an annual evaluation and acceptance of each individual’s skills and competency to verify proficiency as well as compliance with the Certificate Holder’s quality system. This evaluation shall include training records, documented evidence of work performed and on-the-job observations to demonstrate competency. The evaluation shall be documented.

3.3.6 MARKING REQUIREMENTS FOR VALVES TESTED UNDER THE T/O PROGRAM

3.3.6.1 NAMEPLATES

Proper marking and identification of tested valves is critical to ensuring acceptance during subsequent inspections, and also provide for traceability and identification to the valve.

(23) 3.3.6.2 TEST ONLY NAMEPLATE & VALVE SEALING

When a pressure relief valve is tested, a metal test only nameplate marked with the information required below shall be securely attached to the valve adjacent to the original manufacturer’s stamping or nameplate and/or repair nameplate. If not installed directly on the valve, the nameplate shall be securely attached to the valve independent of the external adjustment seals in a manner that does not interfere with valve operation and sealed in accordance with the quality system.

- a) Existing manufacturer/assembler and “VR” nameplates if applicable shall not be removed.
- b) Existing manufacturer/assembler, “VR”, and/or “TO” seals shall remain in place unless removal is required to perform testing or adjustment. Following testing, the valve shall be resealed by the responsible “T/O” Certificate Holder.
- c) Any previous test only nameplates shall be removed.
- d) As a minimum, the information on the “T/O” nameplate (see Figure 3.3.6.2-a) shall include:
 - 1) The name of responsible organization preceded by the words “Tested by” shall be applied.
 - 2) Date of test shall be applied;
 - 3) Set pressure shall be applied;
 - 4) Unique identifier of test shall be applied (e.g., shop order number, work order number, job serial number, etc.);
 - 5) The “T/O” Certification Mark as provided by the National Board; and
 - 6) National Board “T/O” certificate number.

FIGURE 3.3.6.2-A REQUIRED MARKINGS FOR TESTING OF ~~ASME/NATIONAL BOARD~~ “V,” “UV,” AND “HV” STAMPED PRESSURE RELIEF VALVES UNDER THE “T/O” PROGRAM

TESTED BY

T/O®

CERTIFICATE HOLDER

DATE OF TEST

SET PRESSURE

UNIQUE IDENTIFICATION

NATIONAL BOARD “T/O”
CERTIFICATE NUMBER

PART 4, SECTION 4

PRESSURE RELIEF DEVICES — REPAIR OF PRESSURE RELIEF VALVES

4.1 SCOPE

This section provides requirements and guidelines that apply to repairs to pressure relief valves.

- a) Repairs may be required because of defects found during periodic inspection, testing, operation, or maintenance. Since pressure relief devices are provided for safety and the protection of personnel and property, repairs are often regulated by the Jurisdiction where the pressure relief device is installed. The Jurisdiction should be contacted for their specific requirements.
- b) This section describes some of the administrative requirements for the accreditation of repair organizations. Additional administrative requirements can be found in NB-514, *Accreditation of "VR" Repair Organizations*. Some Jurisdictions may independently administer a program of authorization for organizations to perform repairs within that Jurisdiction.
- c) Requirements for repairs and alterations to pressure-retaining items and repair and replacement activities for nuclear items can be found in NBIC Part 3.

4.2 GENERAL REQUIREMENTS

- a) Repair of a pressure relief valve is considered to include the disassembly, replacement, re-machining, or cleaning of any critical part, lapping of a seat and disc, reassembly, adjustment, testing, or any other operation that may affect the flow passage, capacity, function, or pressure-retaining integrity.
- b) Conversions, changes, or adjustments (excluding those as defined in 3.2.5.5 a) or Part 2 Paragraph 2.5.7.5.a)) affecting critical parts are also considered repairs. The scope of conversions may include changes in service fluid and changes such as bellows, soft seats, and other changes that may affect Type/Model number provided such changes are recorded on the document as required for a quality system and the repair nameplate. (See 4.7.1)
- c) The scope of repair activities shall not include changes in ASME Code status.

4.2.1 "VR" REPAIR

- a) When a repair is being performed under the administrative requirements for National Board Accreditation, a repair shall consist of the following operations as a minimum:
 - 1) Complete disassembly, cleaning, and inspection of parts, repair or replacement of parts found to be defective, reassembly, testing as required by 4.6, sealing and application of a repair nameplate. When completed, the valve's condition and performance shall be equivalent to the standards for new valves.
 - 2) The administrative requirements for National Board Accreditation apply only to valves that are ~~constructed to a published standard and if applicable, marked accordingly. marked with the ASME Certification Mark and the "V", "UV", "HV", or "NV" Designator or the sup- planted ASME "V", "UV", "HV" or "NV" Code symbol and have been capacity certified on the applicable fluid by the National Board.~~

4.2.2 CONSTRUCTION STANDARDS FOR PRESSURE RELIEF DEVICES

For pressure relief devices, ~~the applicable new construction standard to be used for reference during repairs is the ASME Code. constructed to the ASME Code.~~ ASME Code Cases shall be used for repairs when they were used in the original

construction of the valve. ASME Code Cases may be used when they have been accepted for use by the NBIC Committee and the Jurisdiction where the pressure-retaining item is installed.

- a) For pressure relief devices, the Code Case number shall be noted on the repair document and, when required by the code case, stamped on the repair nameplate.
- b) The Jurisdiction where the pressure retaining item is installed shall be consulted for any unique requirements it may have established.

4.2.3 INSTALLATION OF PRESSURE RELIEF DEVICES

Installation of a pressure relief device by mechanical methods is not considered to be a repair, as long as no changes or adjustments are made to the device. Seals installed by the device manufacturer or repair organization shall not be removed when the device is installed.

When a pressure relief device is to be installed by welding on an existing pressure retaining item, the requirements of Part 3 of the NBIC for welded repairs shall be followed.

If a pressure relief valve must be disassembled or its adjustments changed as part of the installation process, the reassembly, resetting, retesting or other such activities shall be done by a qualified organization which meets the requirements of NBIC Part 4. For a new pressure relief valve, the original valve manufacturer shall perform this activity as required by the original code of construction.

The installation of a non-reclosing pressure relief device or the replaceable element of a non-reclosing pressure relief device such as a rupture disk is not considered to be a repair. The manufacturer's procedures and instruction shall be followed for the installation of these devices.

4.2.4 INITIAL ADJUSTMENTS TO PRESSURE RELIEF VALVES

The initial installation testing and adjustments of a new pressure relief valve on a boiler or pressure vessel are not considered a repair if made by the manufacturer or assembler of the valve.

4.3 MATERIALS FOR PRESSURE RELIEF VALVE REPAIR

The materials used in making repairs shall conform to the requirements of the original code of construction. The "VR" Certificate Holder is responsible for verifying identification of existing materials from original data, drawings, or unit records and identification of the materials to be installed.

4.3.1 REPLACEMENT PARTS FOR PRESSURE RELIEF DEVICES

- a) Critical parts shall be fabricated by the valve manufacturer or to the manufacturer's specifications. Critical parts are those that may affect the valve flow passage, capacity, function, or pressure-retaining integrity.
- b) Critical parts not fabricated by the valve manufacturer shall be supplied with material test certification for the material used to fabricate the part.
- c) Replacement critical parts receiving records shall be attached or be traceable to the valve repair document (see 4.8.5.4 i)). These records shall conform to at least one of the following.
 - 1) Receiving records documenting the shipping origin of the part fabricated by the valve manufacturer (such as packing list) from the valve manufacturer or assembler of the valve type.
 - 2) A document prepared by the "VR" Certificate Holder certifying that the replacement part used in the repair has the manufacturer's identification on the part or is otherwise labeled or tagged by the

manufacturer and meets the manufacturer's acceptance criteria (e.g., critical dimensions found in maintenance manual).

- 3) Receiving records for replacement critical parts obtained from a source other than the valve manufacturer or assembler of the valve type shall include a document that provides as a minimum:
 - a. The part manufacturer and part designation.
 - b. A certifying statement that either:
 1. The part was fabricated by the valve manufacturer and meets the manufacturer's acceptance criteria (e.g., critical dimensions found in maintenance manual), or
 2. The part meets the manufacturer's specifications and was fabricated from material as identified by the attached material test report.
 - c. The signature of an authorized individual of the part source.
 - d. The name and address of the part source for whom the authorized individual is signing.
- d) Material for bolting shall meet the manufacturer's specification, but does not require material test certification if marked as required by the material specification.

4.4 WELDING FOR PRESSURE RELIEF VALVES

When welding is used as a repair technique during a pressure relief valve repair, the following requirements shall apply.

- a) Welding shall be performed in accordance with the requirements of the original code of construction used for the pressure relief valve.
- b) Cast iron and carbon or alloy steel having a carbon content of more than 0.35% shall not be welded.
- c) Defects in pressure relief valve parts such as cracks, pits, or corrosion that will be repaired by welding shall be completely removed before the weld repair of the part is performed. Removal of the defect shall be verified by suitable NDE as required.
- d) Consideration shall be given to the condition of the existing material, especially in the weld preparation area.

4.4.1 WELDING PROCEDURE SPECIFICATIONS

Welding shall be performed in accordance with Welding Procedure Specifications (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 Section IX of the ASME Code.

4.4.2 STANDARD WELDING PROCEDURE SPECIFICATIONS

A "VR" Certificate Holder may use one or more applicable Standard Welding Procedure Specifications shown in NBIC Part 3, 2.3.

4.4.3 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 Section IX of the ASME Code.

- 3) PRV part repairs shall be documented on a Form R-1 with a statement under the "Remarks" section "PRV Part Repair." The owner's name and location of installation shall be that of the "VR" Certificate Holder. The information received from the "VR" Certificate Holder as required in 4.4.7 a) shall be noted under the "Description of Work" section.
- 4) Upon completion of the repair, the repaired part and completed Form R-1 shall be returned to the "VR" Certificate Holder responsible for completing the PRV repair.

4.5 HEAT TREATMENT

4.5.1 PREHEATING

Preheating may be employed during welding to assist in completion of the welded joint in accordance with 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. The welding procedure specification for the material being welded shall specify the preheat temperature requirements.

4.5.2 POSTWELD HEAT TREATMENT

Postweld heat treatment shall 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. A time and temperature report or temperature record shall be maintained to document the work performed.

4.6 PRESSURE RELIEF VALVE PERFORMANCE TESTING AND TESTING EQUIPMENT

Each pressure relief valve to which the "VR" repair symbol stamp is to be applied shall be subjected to the following tests by the repair Certificate Holder.

4.6.1 TEST MEDIUM AND TESTING EQUIPMENT

Valves ~~shall be tested using the test media specified in the original code of construction. marked for steam service, or having special internal parts for steam service, shall be tested on steam. Valves marked for air, gas, or vapor service shall be tested with air or gas. Valves marked for liquid service shall be tested with water or other suitable liquid. ASME Code, Section IV hot water valves, shall be tested on water, steam, or air.~~

Each valve shall be tested to demonstrate the following:

- 1) Set pressure (as defined by the valve manufacturer and as listed in NB-18, *Pressure Relief Device Certifications*);
 - 2) Response to blowdown, when required by the original code of construction;
 - 3) Seat tightness; and
 - 4) For valves designed to discharge to a closed system, the tightness of the secondary pressure zone shall be tested as required by the original code of construction.
- b) The equipment used for the performance testing prescribed above shall meet the following requirements:
- 1) The performance testing equipment shall include a pressure vessel of adequate volume and pressure source capacity to ensure compliance with 4.6.1 a) 1);

- 2) Prior to use, all performance testing equipment shall be qualified by the Certificate Holder to ensure that the equipment and testing procedures will provide accurate results when used within the ranges established for that equipment. This qualification may be accomplished by benchmark testing, comparisons to equipment used for verification testing as specified in the quality system, or comparisons to field performance. This qualification shall be documented. Documentation of this qualification shall be retained in accordance with Table 4.8.5.4 s). Documentation of this qualification shall include but not be limited to:
 - a. Schematic of the performance test equipment;
 - b. Size and pressure ranges of valves to be tested and the test fluid to be used;
 - c. Dimensions of test vessels;
 - d. Accuracy of pressure measuring equipment;
 - e. Size and design type of valves used to control flow; and
 - f. Method of qualifying.
- 3) Prior to the implementation of any addition or modification to the testing equipment that would alter the contents of the document required in 4.6.1 b) 2), the Certificate Holder shall re-qualify the performance test equipment in accordance with 4.6.1 b) 2). If the equipment changed was used to satisfy the requirements of verification testing, the Certificate Holder shall notify the National Board and additional verification testing, in accordance with the quality system, may be required.

4.6.2 OWNER-USER TESTING OF ASME “UV” DESIGNATED STEAM SERVICE VALVES

When ASME “UV” designated valves are repaired by the owner for the owner’s own use, valves for steam service may be tested on air for set pressure and, if possible, blowdown adjustment, provided the valve manufacturer’s corrections for differential in set pressure between steam and air are applied to determine the test pressure as follows:


- a) The test pressure using air as the test medium shall be the product of the Manufacturer’s correction factor for the differential between steam and air multiplied by the set pressure. If a cold differential test pressure is applicable due to superimposed back pressure and/or service temperature, then the manufacturer’s correction factor shall be applied to the cold differential test pressure. The test pressure shall be recorded on the valve repair document described in 4.8.5.4 i).
- b) The correction factor between steam and air shall not be included in the cold differential test pressure marked on the valve repair nameplate per 4.7.2 b) 8).

4.6.3 LIFT ASSIST TESTING

- a) A device may be used to apply an auxiliary lifting load on the spring of a repaired valve to establish the set pressure in lieu of the tests required in 4.6.1 a) 1) when such testing at full pressure:
 - 1) May cause damage to the valve being tested; or
 - 2) Is impractical when system design considerations preclude testing at full pressure.
- b) While actual valve blowdown and valve performance characteristics cannot be verified using this testing technique, valve set pressure may be determined to an acceptable degree of accuracy if, as a minimum:
 - 1) Equipment utilized is calibrated as required in the quality system; including, but not limited to:

FIGURE 4.7.2-a

EXAMPLE LAYOUT OF REQUIRED MARKINGS FOR REPAIR OF ~~ASME/NATIONAL BOARD~~
~~“V,” “UV,” AND “HV” STAMPED~~ PRESSURE RELIEF VALVES

| | |
|---|--|
| REPAIRED BY | _____ |
| | CERTIFICATE HOLDER |
|  | _____ |
| | (1) TYPE/MODEL NUMBER |
| | _____ |
| | (1) SET PRESSURE CAPACITY |
| | _____ |
| | (1) (1) CDTP BP |
| | _____ |
| | REPAIR IDENTIFICATION |
| | _____ |
| | DATE REPAIRED |
| NATIONAL BOARD “VR” CERTIFICATE NUMBER | |

Note: To be indicated only when changed

4.7.3 CHANGES TO ORIGINAL PRESSURE RELIEF VALVE NAMEPLATE INFORMATION (23)

- Information on the original nameplate or stamping, such as but not limited to set pressure, capacity, blowdown, or type/model number may no longer be valid following certain repair activities. For these repairs, the invalidated information on the original nameplate or stamping shall be marked out but left legible. Any changes to capacity shall be based on that for which the valve was originally certified, or if a conversion has been made, as described in 4.2, on the capacity certification for the valve as converted.
- Repair organizations shall verify the Type/Model number, inlet size, set pressure, and capacity on the original nameplate or stamping that is not marked out. Incorrect information on the original manufacturer's nameplate or stamping shall be marked out but left legible. Corrected information shall be indicated on the repair nameplate and noted on the document as required by the quality system.

4.7.4 ILLEGIBLE OR MISSING NAMEPLATES (23)

The VR Certificate Holder shall not perform repairs under the VR Program on any pressure relief valve (PRV) that cannot be positively identified by the manufacturer or through in-house sources. Such identification shall include the verification of the original ASME Stamping or other marking applicable to the original code of construction. Pressure relief valves that have missing or illegible nameplates and can be positively identified shall be equipped with a nameplate marked “DUPLICATE”, which contains all original nameplate data. For valves constructed to the ASME Code, ~~t~~he duplicate nameplate shall not bear the “NB” Mark or the ASME Certification Mark. To indicate the original designator or code stamping, the duplicate nameplate shall be stamped with a “V”, “HV”, or “UV” as applicable. Illegible nameplates, if applicable, shall not be removed.

4.8 ACCREDITATION OF “VR” REPAIR ORGANIZATIONS

4.8.1 SCOPE

- This section provides requirements that must be met for an organization to obtain a National Board *Certificate of Authorization* to use the “VR” Symbol Stamp for repair activities of pressure relief devices constructed in accordance with ~~the requirements of the ASME Code~~ a published construction standard.

- b) For administrative requirements to obtain or renew a National Board “VR” *Certificate of Authorization* and “VR” Symbol Stamp, refer to NB-514, *Accreditation of “VR” Repair Organizations*.

4.8.2 JURISDICTIONAL PARTICIPATION

The National Board member Jurisdiction in which the “VR” organization is located is encouraged to participate in the review and demonstration of the applicant’s quality system. The Jurisdiction may require participation in the review of the repair organization and the demonstration and acceptance of the repair organization’s quality system manual.

4.8.3 ISSUANCE AND RENEWAL OF THE “VR” CERTIFICATE OF AUTHORIZATION

4.8.3.1 GENERAL

Authorization to use the stamp bearing the official National Board “VR” symbol as shown in Figure 4.7.2-a, will be granted by the National Board pursuant to the provisions of the following administrative rules and procedures.

4.8.3.2 ISSUANCE OF CERTIFICATE

Repair organizations, manufacturers, assemblers, or users that make repairs to ~~the ASME Code symbol-stamped or marked pressure relief valves and National Board capacity certified~~ pressure relief valves may apply to the National Board for a *Certificate of Authorization* to use the “VR” symbol.

4.8.4 USE OF THE “VR” CERTIFICATE OF AUTHORIZATION

4.8.4.1 TECHNICAL REQUIREMENTS

The administrative requirements of 4.8 for use of the “VR” stamp shall be used in conjunction with the technical requirements for valve repair as described in sections 4.1 through 4.7. Those requirements shall be mandatory when a “VR” repair is performed.

4.8.4.2 STAMP USE

Each “VR” symbol stamp shall be used only by the repair firm within the scope, limitations, and restrictions under which it was issued.

4.8.5 QUALITY SYSTEM

4.8.5.1 GENERAL

Each applicant for a new or renewed “VR” *Certificate of Authorization* shall have and maintain a quality system which shall establish that all of these rules and administrative procedures and ~~applicable ASME-Code~~ requirements of the applicable code of construction, including material control, fabrication, machining, welding, examination, setting, testing, inspection, sealing, and stamping will be met.

4.8.5.2 WRITTEN DESCRIPTION

A written description, in the English language, of the system the applicant will use shall be available for review and shall contain, as a minimum, the features set forth in 4.8.5.4. This description may be brief or voluminous, depending upon the projected scope of work, and shall be treated confidentially. In general, the

quality system shall describe and explain what documents and procedures the repair firm will use to validate a valve repair.

4.8.5.3 MAINTENANCE OF CONTROLLED COPY

Each applicant to whom a "VR" *Certificate of Authorization* is issued shall maintain thereafter a controlled copy of the accepted quality system manual with the National Board. Except for changes that do not affect the quality system, revisions to the quality system manual shall not be implemented until such revisions are accepted by the National Board.

4.8.5.4 OUTLINE OF REQUIREMENTS FOR A QUALITY SYSTEM

(23)

The following establishes the minimum requirements of the written description of the quality system. It is required that each valve repair organization develop its own quality system that meets the requirements of its organization. For this reason it is not possible to develop one quality system that could apply to more than one organization. The written description shall include, as a minimum, the following features:

a) Title Page

The title page shall include the name and address of the company to which the National Board *Certificate of Authorization* is to be issued.

b) Revision Log

A revision log shall be included to ensure revision control of the quality system manual. The log should contain sufficient space for date, description and section of revision, company approval, and National Board acceptance.

c) Contents Page

The contents page shall list and reference, by paragraph and page number, the subjects and exhibits contained therein.

d) Statement of Authority and Responsibility

A statement of authority and responsibility shall be dated and signed by an officer of the company. It shall include:

- 1) A statement that the "VR" stamp shall be applied only to pressure relief valves that meet both of the following conditions:
 - a. ~~Constructed to a published standard and if applicable, marked accordingly. Are marked with the ASME Certification Mark and the "V", "UV", "HV", or "NV" Designator or the supplanted ASME "V", "UV", "HV" or "NV" Code symbol and have been capacity certified by the National Board; and~~
 - b. Have been disassembled, inspected, and repaired by the Certificate Holder such that the valves' condition and performance are equivalent to the standards for new valves.
- 2) The title of the individual responsible to ensure that the quality system is followed and who has authority and freedom to effect the responsibility;
- 3) A statement that if there is a disagreement in the implementation of the written quality system, the matter is to be referred to a higher authority in the company for resolution; and
- 4) The title of the individual authorized to approve revisions to the written quality system and the method by which such revisions are to be submitted to and accepted by the National Board before implementation.

e) Organization Chart

A chart showing the relationship between management, purchasing, repairing, inspection, and quality control personnel shall be included and shall reflect the actual organization in place.

f) Scope of Work

- 1) The scope of work section shall indicate the scope and type of valve repairs, including conversions the organization is capable of and intends to perform. The location of repairs (shop, shop and field, or field only), ASME Code Section(s) construction codes or requirements to which the repairs apply, the test medium (air, gas, liquid, or steam, or combinations thereof), and special processes (machining, welding, postweld heat treatment, or nondestructive examination, or combinations thereof) shall be specifically addressed.
- 2) The types and sizes of valves to be repaired, pressure ranges and other limitations, such as engineering and test facilities, should also be addressed.

g) Drawings and Specification Control

The drawings and specification control system shall provide procedures assuring that the latest applicable drawings, specifications, and instructions required are used for valve repair, including conversions, inspection, and testing.

h) Material and Part Control

The material and part control section shall describe purchasing, receiving, storage, and issuing of parts.

- 1) The title of the individual responsible for the purchasing of all material shall be stated.
- 2) The title of the individual responsible for certification and other records as required shall be stated.
- 3) All incoming material and parts shall be checked for conformance with the purchase order and, where applicable, the material specifications or drawings. Indicate how material or part is identified and how identity is maintained by the quality system.

i) Repair and Inspection Program

The repair and inspection program section shall include reference to a document (such as a report, traveler, or checklist) that outlines the specific repair and inspection procedures used in the repair of pressure relief valves. Repair procedures shall require verification that the critical parts meet the valve manufacturer's specification. Supplement 4 outlines recommended procedures covering some specific items. This document shall be retained in accordance with Table 4.8.5.4 s).

- 1) Each valve or group of valves shall be accompanied by the document referred to above for processing through the plant. Each valve shall have a unique identifier (i.e., repair serial number, shop order number, etc.) appearing on the repair documentation and repair nameplate such that trace- ability is established.
- 2) The document referred to above shall describe the original nameplate information, including any marking required by the original code of construction ~~the ASME Code symbol stamping~~ and the repair nameplate information, if applicable. For pilot operated valves, the manufacturer's unique identifier on the pilot and main valve shall also be recorded. In addition, the document shall include material checks, replacement parts, conversion parts (or both), reference to items such as the welding procedure specifications (WPS), fitup, NDE technique, heat treatment, and pressure test methods to be used. Application of the "VR" stamp to the repair name- plate shall be recorded in this document. Specific conversions performed with the new Type/Model number shall be recorded on the document. There shall be a space for "signoffs" at each operation to verify that each step has been properly performed.
- 3) The system shall include a method of controlling the repair or replacement of critical valve parts. The method of identifying each spring shall be indicated on the repair document described in

4.8.5.4 i). Such identification shall be based on the Manufacturer's spring chart current at the time of the repair, except that the spring removed from the valve during the repair bearing different identification may be reinstalled provided the "VR" Certificate Holder has verified the spring is acceptable to the Manufacturer. Such verification shall be documented on the repair document described in 4.8.5.4 i).

- 4) The system shall also describe the controls used to ensure that any personnel engaged in the repair of pressure relief valves are trained and qualified in accordance with this section.

j) Welding, NDE, and Heat Treatment (when applicable)

The quality system manual shall indicate the title of the person(s) responsible for and describe the system used in the selection, development, approval, and qualification of welding procedure specifications, and the qualification of welders and welding operators in accordance with the provisions of 4.4.

- 1) The quality system manual may include controls for the "VR" Certificate Holder to have the pressure relief valve part repaired by a National Board "R" Certificate Holder, per 4.4.7.
- 2) The completed Form R-1 shall be noted on and attached to the "VR" Certificate Holder's document required in 4.8.5.4 i). Similarly, NDE and heat treatment techniques must be covered in the quality system manual. When outside services are used for NDE and heat treatment, the quality system manual shall describe the system whereby the use of such services meet the requirements of the applicable code of construction ~~section of the ASME Code~~.

k) Valve Testing, Setting, and Sealing

The system shall include provisions that each valve shall be tested, set, and all external adjustments sealed according to the requirements of the applicable ~~ASME Code Section~~ code of construction and the National Board. The seal shall identify the "VR" Certificate Holder making the repair. Abbreviations or initials shall be permitted, provided such identification is acceptable to the National Board.

l) Valve Repair Nameplates

An effective valve stamping system shall be established to ensure proper stamping of each valve as required by 4.7.2. The manual shall include a description of the nameplate or a drawing.

m) Calibration

- 1) The manual shall describe a system for the calibration of examination, measuring, and test equipment used in the performance of repairs. Documentation of these calibrations shall include the standard used and the results. Calibration records shall be retained in accordance with Table 4.8.5.4 s).
- 2) All calibration standards shall be calibrated against certified equipment having known valid relationships to nationally recognized standards.

n) Manual Control

The quality system shall include:

- 1) Measures to control the issuance of and revisions to the quality system manual;
- 2) Provisions for a review of the system in order to maintain the manual current with these rules and the applicable code of construction ~~sections of the ASME Code~~;
- 3) The title(s) of the individual(s) responsible for control, revisions, and review of the manual;
- 4) Provision of a controlled copy of the accepted written quality system manual to be submitted to the National Board; and

| | | |
|---|---|--|
| Records of personnel not in the Certificate Holder's employ training and qualification. | The repair organization may use the services of personnel not in their employ to assist the Certificate Holder in the performance of repairs provided they meet the requirements of Section 4.10. Each repair organization shall document the evaluation and acceptance of an individual's qualification for the applicable position. | 5 years after completion of work performed by individual not in the Certificate Holder's employee. |
| Records of audits of the Quality Program. | The repair organization shall audit the Quality System on an annual basis. Audit results shall be documented, and any exclusions shall be noted. | 5 Years |

(23) 4.8.6 FIELD REPAIR

Repair organizations may obtain a "VR" *Certificate of Authorization* for field repair, either as an extension to their in-shop/plant scope, or as a field-only scope, provided that:

- a) Technicians qualified by the Certificate Holder in accordance with Part 4, 4.9.2 perform such repairs;
- b) An acceptable quality system covering field repairs is maintained; and
- c) Functions affecting the quality of the repaired valves are supervised from the address of record where the "VR" certification is issued.

(23) 4.9 COMPETENCY, TRAINING AND QUALIFICATION OF PERSONNEL

(23) 4.9.1 COMPETENCY OF PERSONNEL

The repair organization shall establish the skills, knowledge, competencies, and method to evaluate competencies required for each position within the organization having direct effect on the quality of pressure relief repair performed in accordance with the Certificate of Authorization.

(23) 4.9.2 CONTENTS OF TRAINING PROGRAM

The repair organization shall establish a documented training program to ensure the defined skills, knowledge and competencies are achieved. As a minimum, training objectives for each position shall include:

- a) ~~Applicable ASME Code~~ Requirements of the applicable code of construction;
- b) Applicable NBIC requirements;
- c) Individual responsibilities of each function described within the organization's quality system;
- d) Technical aspects for the applicable position held;
- e) Mechanical skills for the applicable position held;
- f) Special processes as applicable listed on the Certificate of Authorization.



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

| | |
|--------------------------------|---|
| Subject: | Sealing and Tagging of Pilot operated relief valve under VR Program |
| NBIC Location: | 2023 NBIC, Part 4, S4.3 f) and S7.2 a) 2) |
| Statement of Need: | The need for the change is to have a way to ensure that both the pilot and main valve have been repaired to the requirements of NBIC during the same repair. Currently it is difficult to identify if both components have been repaired during the same repair. This makes it challenging under the T/O program to verify this required information. Additionally, under the current code there is the possibility for a non-accredited repair organization to change the pilot with a set and tested pilot which would have seals and repair the main without disturbing the seals. The previous VR tag would be intact as well as the seals upon completion. |
| Background Information: | The discussion around the code allowing the repair of the pilot or main has led to the answer being no, with that said the current code does have measures in place under tagging and sealing to eliminate the possibility of repairing one component. |

Proposed Text:

S4.3 PILOT OPERATED PRESSURE RELIEF VALVES

f) Sealing

After final adjustment and acceptance by quality control, all external adjustments shall be sealed by means assuring positive identification of the organization performing the repair. The tagging process for pilot operated pressure relief valves shall include installing the repair tag on the main valve and pilot valve.