Date Distributed: January 5, 2022

THE NATIONAL BOARD
OF BOILER AND PRESSURE VESSEL INSPECTORS

NATIONAL BOARD INSPECTION CODE SUBGROUP PRESSURE RELIEF DEVICES

AGENDA

Meeting of January 18th, 2022
San Diego, CA

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**

   8:00 AM Pacific Time. For those attending in person, the meeting will be held in Coronet on the third floor of the hotel.

2. **Announcements**

   - The National Board will be hosting a reception on Wednesday evening from 5:30pm to 7:30pm at The Smoking Gun.

   - 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 Le Fontainebleau.

   - A coffee station will be provided outside of the meeting rooms on each floor.

3. **Adoption of the Agenda**

4. **Approval of Minutes from the July 13th, 2021 Meeting**

   The minutes are available for review on the National Board website, www.nationalboard.org.

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

   a. Nominations

   b. Reappointments

   c. Resignations

6. Interpretation Requests

Item Number: 21-62	NBIC Location: Part 4, 4.8.5.4 i) 3)	Attachment Page 2

General Description: Verification of existing spring during repair activities

Task Group: None assigned

Explanation of Need: This requirement has created an administrative requirement that potentially prevents a VR Stamp holder from applying the "VR" stamp to valves they have repaired. The requirement is negatively impacting owners, and jurisdictions that enforce the NBIC Part 4. This clause introduces a unique requirement in the BPV industry to confirm that code material in a Code stamped item be verified and traceable at all time after the item is ASME code stamped but the verification can only be provided by the manufacturer. Historically, any valve received or worked on that was sealed by a VR Stamp holder or in the case of an initial repair the ASME assembler was deemed to be Code compliant, and no further verification was needed recognizing the validity and continuity of the ASME and VR quality programs. It is clearly understood that if a spring, or any other critical part is deemed necessary to be replaced during a repair the manufactures verification is required and justifiable.

January 2022 Meeting Action:

7. Action Items

Item Number: NB15-0305	NBIC Location: Part 4	Attachment Page 3

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

July 2021 Meeting Action: Passed SG letter ballot. Since this proposal affects Parts 1 and 2, SG/SC Installation and Inspection will be letter balloted between meetings. Prior to proceeding with SC PRD and Main Committee letter ballots.

Update: The proposal was balloted to subcommittee PRD and Installation and received a few disapproval votes that need to be addressed.

Item Number: NB15-0307	NBIC Location: Part 4	Attachment Page 5

General Description: Create Guidelines for Repair of Pin Devices.

Task Group: D. McHugh (PM), A. Renaldo, T. Tarbay, R. McCaffrey, Jay Simms, C. Beair, C. Chernisky

July 2021 Meeting Action: Item was letter balloted to SG between meetings and received a couple of negatives and comments. Task group will respond to the comments and revise proposal accordingly.

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

July 2021 Meeting Action: Work continues on this item. Possible letter ballot to SG between meetings.

Item Number: 17-119	NBIC Location: Part 4, 2.2.5 and Part 1, 2.9.1.4	No Attachment

General Description: States pressure setting may exceed 10% range. Clarify by how much.

Task Group: T. Patel (PM), D. Marek, J. Ball, R. Donaldson

July 2021 Meeting Action: Work continues on this item. Item maybe reopened in ASME.

Item Number: 19-37	NBIC Location: Part 4, 4.3.1 c) 4)	No Attachment

General Description: Origin of Replacement Parts for Pressure Relief Devices

Task Group: A. Cox (PM), T. Patel, P. Dhobi, J. Simms

July 2021 Meeting Action: Work continues on this item. Should have proposal ready for letter ballot between meetings.

Item Number: 19-83	NBIC Location: Part 4, Part 1	Attachment Page 46

General Description: Address alternate pressure relief valve mounting permitted by ASME CC2887-1.

Task Group: D. Marek (PM), T. Patel, J. Ball

July 2021 Meeting Action: This item passed SC letter ballot, but did not receive enough votes from SG/SC Installation. Installation to look at/comment on item this meeting. If changes are necessary, it will be brought back. If no changes, item to be sent to Main Committee for letter ballot.

Update: The proposal was balloted to Subcommittee Installation and received three disapproval votes that need to be discussed.

Item Number: 20-85	NBIC Location: Part 4, 3.2.6	No attachment

General Description: Add language to Part 4, 3.2.6 to define test intervals for thermal fluid heaters for PRD's

Subgroup: PRD

Task Group: B. Nutter (PM), T. Patel, D. Schirmer, J. Wolf

Explanation of Need: Need to align Part 4 language with work done under Item 19-88.

July 2021 Meeting Action: A task group was formed to work on this item.

Item Number: 21-05	NBIC Location: Part 4, 3.3 and 4.8	Attachment Page 51

General Description: Develop specific requirements for Shop and Field Audits for VR & T/O Certificate Holders

Subgroup: PRD
Task Group: A. Donaldson (PM), A. Cox, J. Simms, P. Dhobi, T. Tarbay, D. Marek

Explanation of Need: There has long been a requirement for an Annual Audit of Field Activities for VR and, more recently, T/O Activities. This same opportunity for improvement should be extended to Shop Activities that involve for T/O or VR Repair, as applicable, are properly performed and documented.

July 2021 Meeting Action: A task group was formed to work on this item. Item General Description revised to include scope of 19-1.

Update: This item is currently being balloted to SC PRD.

Item Number: 21-08	NBIC Location: Part 4, S4.4	No attachment

General Description: Additional guidance for tank vent repairs

Subgroup: PRD
Task Group: D. DeMichael (PM), B. Donaldson, B. Nutter, K. Beise, J. Grace

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.

A task group was formed to work on this item.

Item Number: 21-18	NBIC Location: Part 4, 4.6.4	Attachment Page 54

General Description: Pressure tests for pressure relief valve parts.

Subgroup: PRD
Task Group: J. Simms (PM), T. Tarbay, A. Donaldson, D. DeMichael, T. Patel, B. Nutter

Explanation of Need: Pressure relief valve manufacturers must produce valve parts that comply with ASME Code requirements to be able to apply the ASME Symbol Stamp and Designator to a new valve. These parts are the same that are sold as repair parts. The logistic issues to fabricate and maintain an inventory of spare parts not complying with ASME Code requirements is significant versus producing all parts in compliance with code. Consequently, why have a pressure test requirement for parts purchased from the valve manufacturer for those certificate holders who chose to buy parts produced by the manufacturer?

July 2021 Meeting Action: A task group was formed to work on this item.

8. New Business

Item Number: 21-36	NBIC Location: Part 4, 3.3.3.4 i)	Attachment Page 56

General Description: Add Test Details to NBIC Part 4, 3.3.3.4 i) Valve Adjustment and Sealing

Subgroup: PRD

Task Group: None assigned

Explanation of Need: There is no reference in the T/O requirements for Set Pressure Testing, use of proper Test Fluid or Seat Tightness unless and until a minor adjustment is required. This is surely the intent, but it is not clearly specified as it is in the current VR requirements.

January 2022 Meeting Action:

Item Number: 21-49	NBIC Location: Part 4, 3.3.3.4 l) 5)	Attachment Page 57

General Description: Change 3.3.3.4 l) 5) to be consistent with 4.8.5.4 n) 5)

Subgroup: PRD

Task Group: None assigned

Explanation of Need: The intent was that the changes to a certificate holder's QC Manual would be accepted prior to being implemented. This change in text clarifies the intent.

January 2022 Meeting Action:

Item Number: 21-51	NBIC Location: Part 4, Supplement 3	Attachment Page 59

General Description: Clarify relief valve term to be pressure relief valve in Supplement 3

Subgroup: PRD

Task Group: None assigned

Explanation of Need: Several places refer to relief valve or valve. Should be pressure relief valve to be consistent with the rest of the book.

January 2022 Meeting Action:

Item Number: 21-52	NBIC Location: Part 4, 2.5.3 a) & Part 1, 4.5.3 a)	Attachment Page 61

General Description: Incorrect paragraph reference at end of Part 4 2.5.3 a) and Part 1 4.5.3 a)

Subgroup: PRD

Task Group: None assigned

Explanation of Need: Paragraph reference at end of Part 4, 2.5.3 a) and Part 1, 4.5.3 a) should be 2.5.6 e) and 4.5.6 e) not e)2) since all of the requirements of e apply to isolation valves not just e)2)

January 2022 Meeting Action:

Item Number: 21-59	NBIC Location: Part 4, 3.2.6.1	No Attachment

General Description: Deferral of inspection due dates (pressure relieving devices NBIC PART IV)

Subgroup: PRD

Task Group: None assigned

Explanation of Need: Since the code has clearly recommended inspection frequency intervals for the different classes of pressure relief devices, it shall have the requirements related to the deferral of due dates. The inspection due date deferrals are usually not considered but in exceptional cases where operating plant may not be able to handover the device due to some practical limitations or the turnaround frequency of the plant is extended due to stakeholders' requirements etc. The owner is usually ensuring that a deferment is not posing any significant EHSS risk by proper risk analysis but a clarity from code on the minimum or maximum duration the device can be deferred will add a great value in decision making. There are some codes which have added deferment clauses such as API 510 but the NBIC is always having precedence in this subject and shall have statement added to its code.

January 2022 Meeting Action:

Item Number: 21-61	NBIC Location: Part 4, 3.3.4	No Attachment

General Description: Audit Requirements for the T/O holder

Subgroup: PRD

Task Group: None assigned

Explanation of Need: Opened as a result of a Subgroup PRD ballot comment from item 21-05 (Shop audits for VR certificate holders). The comment recommended adding requirements specifically for organizations that are T/O only.

January 2022 Meeting Action:

Item Number: 21-63	NBIC Location: Part 4, 4.7.2	Attachment Page 62

General Description: Require unique identifier marked on Pilots in addition to main valves

Subgroup: PRD

Task Group: None assigned

Explanation of Need: The 2021 Edition of ASME BPVC Section XIII requires pilots of pilot operated pressure relief valves be marked with a unique identifier that matches the main valve (Section I has similar approved text for the 2023 Edition). This should be addressed for VR nameplates as well since pilots can be replaced as VR operation.

January 2022 Meeting Action:

Item Number: 21-72	NBIC Location: Part 4, 4.7.2 b)	Attachment Page 63

General Description: Remove reasons for changes in 4.7.2 b) 6) and 7)

Subgroup: PRD

Task Group: None assigned

Explanation of Need: Capacity could change for reasons other than set pressure or service fluid change (for example error or superimposed back pressure for liquid valve being introduced). Type/Model numbers can change for reasons other than a conversion. Sometimes manufacturers include set pressure in the type or model number. A set pressure change is not considered a conversion. Also, error correction could be a reason.

January 2022 Meeting Action:

Item Number: 21-73	NBIC Location: Part 4, 4.7.3	Attachment Page 64

General Description: Simplify paragraph 4.7.3

Subgroup: PRD

Task Group: None assigned

Explanation of Need: Subparagraphs a) through d) are repetitive and can be consolidated to simplify the overall requirement of if changes are made, they should be marked out and left legible.

January 2022 Meeting Action:

Item Number: 21-76	NBIC Location: Part 4, 3.2.4.3 and Part 2, 2.5.5.3	Attachment Page 65

General Description: Update ASME paragraph reference in Part 4, 3.2.4.3 and Part 2, 2.5.5.3

Subgroup: PRD

Task Group: None assigned

Explanation of Need: ASME Section VIII Div. 1 updated pressure relief device paragraph references as a result of publishing Section XIII. UG-135 should now be UG-156

January 2022 Meeting Action:

9. Presentations

10. Future Meetings

- July 2022 – TBD
- January 2023 – TBD

11. Adjournment

Respectfully Submitted,

Thomas P. Beirne, P.E.
Secretary, NBIC Subgroup Pressure Relief Devices
pc: J. Amato
B. Wielgoszinski
J. Ellis

Beise	Kim	National Board Certificate Holders	Chair	07/30/2023	Details
Marek	Daniel	General Interest	Vice Chair	07/30/2023	Details
Beirne	Thomas		Secretary	06/29/2099	Details
Brodeur	Marianne	National Board Certificate Holders	Member	01/30/2023	Details
Cox	J. Alton	General Interest	Member	01/30/2023	Details
DeMichael	Denis	Users	Member	01/30/2023	Details
Dhobi	Prakash	National Board Certificate Holders	Member	10/30/2022	Details
Donaldson	Alfred	Manufacturers	Member	10/30/2022	Details
Donalson	Robert	Manufacturers	Member	01/30/2023	Details
McCaffrey	Raymond	General Interest	Member	01/30/2023	Details
McHugh	David	National Board Certificate Holders	Member	01/30/2023	Details
Nutter	Brandon	National Board Certificate Holders	Member	01/30/2023	Details
Patel	Thakor	Manufacturers	Member	01/30/2023	Details
Renaldo	Adam	Users	Member	01/30/2023	Details
Schirmer	Delton	Authorized Inspection Agencies	Member	01/30/2023	Details
Simms	Jay	Manufacturers	Member	01/30/2024	Details
Tarbay	Thomas	General Interest	Member	10/30/2022	Details
Wolf	Jon	Authorized Inspection Agencies	Member	01/30/2023	Details

PROPOSED INTERPRETATION

Item No.

21-62

Subject/Title

Verification of existing spring during repair activities

Project Manager and Task Group

Source (Name/Email)

Eben Creaser / eben.creaser@gnb.ca

Statement of Need

This requirement has created an administrative requirement that potentially prevents a VR Stamp holder from applying the "VR" stamp to valves they have repaired. The requirement is negatively impacting owners, and jurisdictions that enforce the NBIC Part 4. This clause introduces a unique requirement in the BPV industry to confirm that code material in a Code stamped item be verified and traceable at all time after the item is ASME code stamped but the verification can only be provided by the manufacturer. Historically, any valve received or worked on that was sealed by a VR Stamp holder or in the case of an initial repair the ASME assembler was deemed to be Code compliant and no further verification was needed recognizing the validity and continuity of the ASME and VR quality programs. It is clearly understood that if a spring, or any other critical part is deemed necessary to be replaced during a repair the manufactures verification is required and justifiable.

Background Information

VR Stamp holders in almost all cases do not have direct access to the various manufactures spring charts to perform the verification. Spring charts are also revised over time, as a result determining the the correct spring chart can be difficult. Also acessing obsolete charts for valves built to previous editions is also a barrier to compliance. In many other situations, especially in the case of smaller PRVs (<2" & <500PSI) an existing spring might not be marked with permanent markings even when it was new (ie stamping) and any temporary marking usually in the form of paint colour codes used during initial assembly is no longer present.

Proposed Question

Is it the intent of 4.8.5.4 i) 3) that the "VR" Stamp is not permitted to be applied to any valve when the VR Certificate holder is unable to receive verification from the manufacturer that the existing spring is correct.

Proposed Reply

No

Committee's Question 1

Committee's Reply 1

Rationale

Committee's Question 2

Committee's Reply 2

PART 1

4.5 ~~PRESSURE RELIEF DEVICES~~OVERPRESSURE PROTECTION

See NBIC Part 1, 4.1 for the scope of pressure vessels covered by these requirements.

~~Pressure relief devices protecting pressure vessels shall meet the following requirements.~~When overpressure protection is provided by a pressure relief device or devices, the requirements in 4.5.1 through 4.5.6 apply. If overpressure protection is provided by Overpressure Protection by System Design in lieu of a pressure relief device or devices, the requirements in 4.5.7 apply.

~~4.5.7~~ OVERPRESSURE PROTECTION BY SYSTEM DESIGN

See NBIC Part 4, 2.5.8.

PART 2

2.3.5 INSPECTION OF PRESSURE VESSEL PARTS AND APPURTENANCES

2.3.5.2 SAFETY DEVICES

See NBIC Part 2, 2.5 for the inspection of safety devices (pressure relief valves and non-closing devices such as rupture disks) and NBIC Part 2, 2.6 for Overpressure Protection by System Design in lieu of a pressure relief device or devices used to prevent the overpressure of pressure vessels.

2.6 OVERPRESSURE PROTECTION BY SYSTEM DESIGN

See NBIC Part 4, 2.5.8.

PART 4

2.5 PRESSURE VESSEL ~~PRESSURE RELIEF DEVICES~~OVERPRESSURE PROTECTION

See NBIC Part 1, 4.1 for the scope of pressure vessels covered by the requirements of Part 4, 2.5.

When overpressure protection is provided by a pressure relief device or devices the requirements in 2.5.1 through 2.5.7 apply. If overpressure protection is provided by Overpressure Protection by System Design in lieu of a pressure relief device or devices, then the requirements in 2.5.8 apply.~~Pressure relief devices protecting pressure vessels shall meet the following requirements:~~

2.5.8 OVERPRESSURE PROTECTION BY SYSTEM DESIGN

Overpressure protection by system design may be used in lieu of a pressure relief device or devices if permitted by the Jurisdiction and the applicable Section of the ASME BPV Code. Compliance with the pressure vessel code requirements shall be documented in a report that includes as a minimum:

a) For pressure vessels for which the pressure is self-limiting
   1) The signature of the individual in responsible charge of the management of the operation of the vessel
   2) Detailed process and instrument flow diagrams, showing all pertinent elements of the system associated with the vessel
   3) A description of all operating and upset scenarios, including scenarios involving fire and those that result from operator error, and equipment and/or instrumentation malfunctions

4) An analysis showing the maximum coincident pressure and temperature that can result from each of the scenarios listed in item 3) above does not exceed the MAWP at that temperature
5) For a new vessel, a copy of the vessel's Manufacturer's data report stating that overpressure protection is provided by system design
6) For an existing vessel whose Manufacturer's data report does not state overpressure by system design, a copy of the Manufacturer's data report with an attachment signed by the user indicating that overpressure protection is being provided by system design.

b) For pressure vessels for which the pressure is not self-limiting
1) The signature of the individual in responsible charge of the management of the operation of the vessel
2) Detailed process and instrument flow diagrams (P&IDs), showing all pertinent elements of the system associated with the vessel
3) A description of all operating and upset scenarios, including those involving fire and those that result from operator error, and equipment and/or instrumentation malfunctions
4) A detailed description of any safety critical instrumentation used to limit the system pressure, including the identification of all truly independent redundancies and a reliability evaluation (qualitative or quantitative) of the overall safety system
5) An analysis showing the maximum pressure that can result from each of the scenarios
6) For a new vessel, a copy of the vessel's Manufacturer's data report stating that overpressure protection is provided by system design
7) For an existing vessel whose Manufacturer's data report does not state overpressure by system design, a copy of the Manufacturer's data report with an attachment signed by the user indicating that overpressure protection is being provided by system design.

ACCREDITATION PROGRAMS

The National Board administers four specific accreditation programs as shown below:

"**R**".....Repairs and Alterations to Pressure-Retaining Items (NB-415)
"**VR**"… .....Repairs to Pressure Relief Valves and Pin Devices (NB-514)
"**NR**"… .....Repair and Replacement Activities for Nuclear Items (NB-417)
"**T/O**"… ....Testing of Pressure Relief Valves (NB-528)

The administrative requirements for the accreditation for these accreditation programs can be viewed on the National Board Website at www.nationalboard.org.

The National Board also administers accredits four specific inspection agency programs as shown below:

New Construction

National Board Acceptance of Authorized Inspection Agencies (AIA) *Accredited by the American Society of Mechanical Engineers* (ASME) (NB-360)

PART 4, SECTION 1
PRESSURE RELIEF DEVICES — GENERAL AND ADMINISTRATIVE REQUIREMENTS

1.1 SCOPE

This Part provides guidelines and requirements for the installation, in-service inspection and testing, and repairs of pressure relief devices.

1.2 CONSTRUCTION STANDARDS FOR PRESSURE RELIEF DEVICES

a) When the standard governing the original construction is the ASME Code, installation and repairs to pressure relief devices shall conform to the ASME Code section and edition most applicable to the work planned.

b) If the pressure relief device was not constructed to the ASME Code, then installation, inspection and repair shall wherever possible reference the original code of construction most applicable to the work.

c) If the pressure relief device was not constructed to any recognized construction code or standard, then installation, inspection, and repair shall reference a construction standard or specification most applicable to the work.

d) Where this is not possible or practicable, it is permissible to use other codes, standards, or specifications, including the ASME Code, provided there is concurrence of the Inspector (if applicable) and the Jurisdiction where the pressure relief device is installed.

1.3 PRESSURE RELIEF DEVICES — DEFINITIONS

Refer to Section 9, *Glossary* for definitions relating to pressure relief devices.

1.3.1 ADDITIONAL DEFINITIONS RELATING TO PRESSURE RELIEF DEVICES

Unless otherwise specified in the NBIC, the definitions relating to pressure relief devices in Section 2 of ASME PTC-25 shall apply.

1.4 ACCREDITATION

a) The National Board administers four specific accreditation programs:

"**R**" — Repairs and Alterations to Pressure-Retaining Items

"**VR**" — Repairs to Pressure Relief Valves and Pin Devices

"**NR**" — Repair and Replacement Activities for Nuclear Items

"**T/O**" — In-service Testing Only of Pressure Relief Valves

b) Organizations performing repairs and in-service testing to pressure relief valves shall be accredited as described in this section, as appropriate for the scope of work to be performed.

c) Organizations performing repairs and in-service testing to pressure relief valves outside the scope of the NBIC may be accredited and shall meet any additional requirements of the Jurisdiction where the work is performed.

1.4.1 ACCREDITATION PROCESS

a) The National Board administers accreditation programs for authorization of organizations performing repairs and in-service testing to pressure relief ~~valves.~~devices.

b) Any organization may apply to the National Board to obtain a *Certificate of Authorization* for a requested scope of activities. A review shall be conducted to evaluate the organization's Quality System. The individual assigned to conduct the evaluation shall meet the qualification requirements prescribed by the National Board. Upon completion of the evaluation, any deficiencies within the organization's Quality System will be documented and a recommendation will be made to the National Board regarding issuance of a *Certificate of Authorization*.

c) National Board procedures provide for the confidential review resulting in recommendations to issue or not issue a *Certificate of Authorization*.

d) The accreditation program provides requirements for organizations performing repairs and in-service testing to pressure relief ~~valves~~devices. Depending upon the expected scope of activities at the time of review, organizations may be authorized to perform repairs and in-service testing either in the shop only, field only, or shop and field. Repair and in-service testing activities shall be limited to the scope of work authorized.

e) Organizations desiring to renew or obtain a National Board *Certificate of Authorization* shall apply to the National Board using forms obtained from the National Board. Application for renewal shall be made prior to the expiration date of the *Certificate of Authorization*.

f) When an organization has shops in more than one location, the organization shall submit separate applications for each shop. The organization may perform repairs in its shop or in the field, provided such operations are described in the organization's Quality System.

2.4.5 PRESSURE RELIEF VALVES FOR TANKS AND HEAT EXCHANGERS

2.4.5.1 STEAM TO HOT-WATER SUPPLY

When a hot-water supply is heated indirectly by steam in a coil or pipe within the service limitations set forth in Part 1, 3.2*, Definitions*, the pressure of the steam used shall not exceed the safe working pressure of the hot water tank, and a pressure relief valve at least NPS 1 (DN 25), set to relieve at or below the maximum allowable working pressure of the tank, shall be applied on the tank.

2.4.5.2 HIGH TEMPERATURE WATER TO WATER HEAT EXCHANGER

When high temperature water is circulated through the coils or tubes of a heat exchanger to warm water for space heating or hot-water supply, within the service limitations set forth in Part 1, 3.2, *Definitions*, the heat exchanger shall be equipped with one or more National Board capacity certified pressure relief valves set to relieve at or below the maximum allowable working pressure of the heat exchanger, and of sufficient rated capacity to prevent the heat exchanger pressure from rising more than 10% above the maximum allowable working pressure of the vessel.

2.4.5.3 HIGH TEMPERATURE WATER TO STEAM HEAT EXCHANGER

When high temperature water is circulated through the coils or tubes of a heat exchanger to generate low pressure steam, within the service limitations set forth in Part 1, 3.2, *Definitions*, the heat exchanger shall be equipped with one or more National Board capacity certified pressure relief valves set to relieve at a pressure not to exceed 15 psig (100 kPa), and of sufficient rated capacity to prevent the heat exchanger pressure from rising more than 5 psig (34 kPa) above the maximum allowable working pressure of the vessel. For heat exchangers requiring steam pressures greater than 15 psig (100 kPa), refer to NBIC Part 1, Section 2 or Section 4.

2.5 PRESSURE VESSEL PRESSURE RELIEF DEVICES

See NBIC Part 1, 4.1 for the scope of pressure vessels covered by the requirements of Part 4, 2.5.

Pressure relief devices protecting pressure vessels shall meet the following requirements:

2.5.1 PRESSURE RELIEF DEVICE REQUIREMENTS

a) Pressure relief devices shall be manufactured in accordance with a national or international standard and be certified for capacity or flow resistance by the National Board.

b) Dead weight or weighted lever pressure relief ~~valves~~devices shall not be used.

c) An unfired steam boiler shall be equipped with pressure relief valves as required in NBIC Part 4, 2.2.

d) Pressure relief devices shall be selected (i.e., material, pressure, etc.) and installed such thattheir proper functioning will not be hindered by the nature of the vessel's contents.

2.5.2 NUMBER OF PRESSURE RELEIF DEVICES

At least one pressure relief device shall be provided for protection of a pressure vessel. Pressure vessels with multiple chambers with different maximum allowable working pressures shall have a pressure relief device to protect each chamber under the most severe coincident conditions.

3.2.2 INSPECTION REQUIREMENTS FOR DEVICE CONDITION

a) The ~~valve or~~ pressure relief device shall be checked for evidence that it is leaking or not sealing properly. Evidence of leakage through pressure-relief device ~~valves~~ may indicate that the system is being operated at a pressure
that is too close to the pressure relief device~~valve's~~ set pressure. (See Supplement 2 for guidance on the pressure differential between the pressure relief device~~valve~~ set pressure and system operating pressure.)

b) Seals for adjustments shall be intact and show no evidence of tampering.

c) Connecting bolting should be tight and all bolts intact.

d) The ~~valve or~~ pressure relief device should be examined for deposits or material buildup.

e) The ~~valve or~~ pressure relief device shall be checked for evidence of rust or corrosion.

f) The ~~valve or~~ pressure relief device shall be checked for damaged or misapplied parts.

g) If a drain hole is visible, the valve or device should be checked to ensure it is not clogged with debris or deposits.

h) The valve or device shall be checked for test gags left in place after pressure testing of the unit.

i) Bellows pressure relief device~~valves~~ shall be checked to ensure the bonnet vent is open or piped to a safe location. The vent shall not be plugged since this will cause the pressure relief device ~~valve~~ set pressure to be high if the bellows develops a leak. Leakage noted from the vent indicates the bellows is damaged and will no longer protect the valve from the effects of back pressure.

3.2.3 INSPECTION REQUIREMENTS FOR INSTALLATION CONDITION

a) Inlet piping shall be inspected to ensure it meets the requirements of the original code ofconstruction. For pressure relief device ~~valves~~, the inlet pipe shall be checked to ensure the inlet pipe size is not smaller than the device inlet size.

b) Discharge piping shall be inspected to ensure it meets the original code of construction. For pressure relief relief device ~~valves~~, the discharge pipe shall be checked to ensure the discharge pipe size is not smallerthan the device outlet size.

c) The pressure relief device ~~valve~~ drain piping shall be checked to ensure the piping is open.

d) The discharge piping shall be checked to ensure it drains properly.

e) The inlet and discharge piping shall be checked to ensure they are not binding or placing excessive stress on the pressure relief device ~~valve~~ body, which can lead to distortion of the pressure relief device ~~valve~~ body and leakage or malfunction.

f) The condition and adequacy of the pipe supports shall be inspected. Discharge piping should be supported independent of the device itself.

g) The pressure relief device ~~valve~~ discharge and discharge pipe shall be checked for possible hazards to personnel.

h) The installation shall be checked to ensure that there are no intervening isolation valves between the pressure source and the pressure relief device~~valve~~ inlet or between the valve outlet and its point of discharge. Isolation valves may be permitted in some pressure vessel service. (See 2.5.6 e)), and Jurisdictional require~~-~~ ments. Isolation valves shall not be used for power boilers, heating boilers, or water heaters.

i) A change-over valve, which is used to install two pressure relief devices on a single vessel location for the purpose of switching from one device to a spare device, is not considered a block valve if it is arranged such that there is no intermediate position that will isolate both pressure relief devices

8) Rupture disks are often used to isolate pressure relief valves from services where fouling or plugging of the valve inlet occurs. This tendency should be considered in establishing the inspection frequency.

9) Since rupture disks are non-reclosing devices, a visual inspection is the only inspection that can be performed. A rupture disk that is removed from its holder shall not be reinstalled unless recommended by the manufacturer. A rupture disk contained in an assembly that can be removed from a system without releasing the force maintaining the contact between the disk and holder, such as pre-torqued, welded, soldered, and some threaded assemblies, may be suitable for reinstallation after visual inspection. The manufacturer should be consulted for specific recommendations.

10) It is recommended that all rupture disks be periodically replaced to prevent unintended failure while in service due to deterioration of the device. Rupture disks should be carefully checked for damage prior to installation and handled by the disk edges, if possible. Any damage to the surface of the ruptured disk can affect the burst pressure.

3.2.5 TESTING AND OPERATIONAL INSPECTION OF PRESSURE RELIEF DEVICES

a) Pressure relief devices ~~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 specified for these operating requirements in the original code of construction shall be used to deter- mine the acceptability of test resul ts.

b) Testing may be accomplished by the owner on the unit where the valve is installed or at a qualified test facility. In many cases, testing on the unit may be impractical, especially if the service fluid is hazardous or toxic. Testing on the unit may involve the bypassing of operating controls and should only be performed by qualified individuals under carefully controlled conditions. It is recommended that a written procedure be available to conduct this testing.

1) The Inspector should ensure that calibrated equipment has been used to perform this test and the results should be documented by the owner.

2) If the testing was performed at a test facility, the record of this test should be reviewed to ensurethe valve meets the requirements of the original code of construction. Valves which have been in toxic, flammable, or other hazardous services shall be carefully decontaminated before being tested. In particular, the closed bonnet of valves in these services may contain fluids that are not easily removed or neutralized. If a test cannot be safely performed, the valve shall be disassembled, cleaned, and decontaminated, repaired, and reset.

3) If a valve has been removed for testing, the inlet and outlet connections should be checked for blockage by product buildup or corrosion.

c) Valves may be tested using lift assist devices when testing at full pressure may cause damage to the valve being tested, or 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.

d) If valves are not tested on the system using the system fluid, the following test mediums shall beused:

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;

2) Pressure of 400 psig (2.76 MPa) or greater: Set pressure test to verify nameplate set pressure every three years or as determined by operating experience as verified by testing history.

3) Set pressure tests should be performed prior to bringing the boiler down for planned internal inspection so needed repairs or adjustments can be made while the boiler is down.

b) High-Temperature Hot-Water Boilers

Set pressure test annually to verify nameplate set pressure or as determined by operating experience as verified by testing history. For safety reasons, removal and testing on a steam test bench is recommended. Such testing will avoid damaging the pressure relief valve by discharge of a steam water mixture, which could occur if the valve is tested in place.

c) Organic Fluid Vaporizers

Pressure relief valves shall be disconnected from the vaporizer at least once yearly, when they shall be inspected, tested, repaired if necessary, and then replaced on the vaporizer.

d) Low-Pressure Steam Heating Boilers

Manual check quarterly; set pressure test annually prior to steam heating season to verify nameplate set pressure.

e) Hot-Water Heating Boilers

Manual check quarterly; pressure test annually prior to heating season to verify nameplate set pressure.

Note: The frequencies specified for the testing of pressure relief valves on boilers is primarily based on differences between high pressure boilers that are continuously manned, and lower pressure automatically controlled boilers that are not monitored by a boiler operator at all times. When any boiler experiences an overpressure condition such that the pressure relief valves actuate, the valves should be inspected for seat leakage and other damage as soon as possible and any deficiencies corrected.

f) Water Heaters

Manual check every two months, or as determined based upon inspection history and manufacturer recommendations. Every 3 years, remove temperature and pressure relief valve to inspect temperature probe for damage, buildup, or corrosion. The temperature probe shall be checked for the condition of the coating material and freedom of movement without detaching. If the probe pulls out or falls off during inspection, the valve shall be repaired or replaced. Due to the relatively low cost of temperature and pressure relief valves for this service, it is recommended that a defective valve be replaced with a new valve if a repair or resetting is indicated.

g) Pressure Vessels and Piping

Frequency of test and inspection of pressure relief devices for pressure vessel and piping service is greatly dependent on the nature of the contents, external environment, and operation of the system, therefore only general recommendations can be given. Inspection frequency should be based on previous inspection history. If, during inspection, pressure relief devices ~~valves~~ are found to be defective or damaged, intervals should be shortened until acceptable inspection results are obtained. Where test records and/or inspec- tion history are not available, the following inspection and test frequencies are suggested:

Service	Inspection Frequency
Steam	Annual
Air and Clean Dry Gases	Every three years
Pressure relief valves in combination with rupture disks	Every five years
Propane, Refrigerant	Every five years
All Others	Per inspection history

3.2.6.1 ESTABLISHMENT OF INSPECTION AND TEST INTERVALS

Where a recommended test frequency is notlisted, the pressure relief device~~valve~~ user and Inspector must determine and
agree on a suitable interval for inspection and test. Some items to be considered in making this determination are: b)

a) Jurisdictional requirements;

b) Records of test data and inspections from similar processes and similar devices in operation at that facility;

c) Recommendations from the device manufacturer. In particular, when the pressure relief device~~valve~~ includes non-metallic
parts such as a diaphragm or soft seat, periodic replacement of those parts may be specified;

d) Operating history of the system. Systems with frequent upsets where a pressure relief device~~valve~~ has actuated requiremore frequent inspection;

e) Results of visual inspection of the device and installation conditions. Signs of pressure relief device~~valve~~ leakage, corrosion or damaged parts all indicate more frequent operational inspections;

f) ~~***Installation of a pressure relief device valve in a system with a common discharge header.~~ Pressure relief devices~~Valves~~ discharging into a common collection pipe may be affected by the discharge of other devices, ~~valves~~ by the corrosion of parts in the outlet portion of the devices, ~~valve~~ or the buildup of products discharged from those devices. ~~valves~~;**

g) Ability to coordinate with planned system shutdowns. The shutdown of a system for other maintenance or inspection activities is an ideal time for the operational inspection and test of a pressure relief device~~valve~~;

h) Critical nature of the system. Systems that are critical to plant operation or where the effects of the discharge of fluids from the system are particularly detrimental due to fire hazard, environmental damage, or toxicity concerns all call for more frequent inspection intervals to ensure devices are operating properly; and

i) Where the effects of corrosion, blockage by system fluid, or ability of the pressure relief device ~~valve~~ to operate under given service conditions are unknown (such as in a new process or installation), a relatively short inspection interval, not to exceed one year or the first planned shutdown, whichever is shorter, shall be estab- lished. At that time the pressure relief device shall be visually inspected and tested. If unacceptable test results are obtained, the inspection interval shall be reduced by 50% until suitable results are obtained.

3.2.6.2 ESTABLISHMENT OF SERVICE INTERVALS

a) The above intervals are guidelines for periodic inspection and testing. Typically if there are no adverse findings, a pressure relief device~~valve~~ would be placed back in service until the next inspection. Any unaccept- able conditions that are found by the inspection shall be corrected immediately by repair or replacement of the device. Many users will maintain spare pressure relief devices so the process or

system is not affected by excessive downtime.

PART 4, SECTION 4
PRESSURE RELIEF DEVICES — REPAIR OF PRESSURE RELIEF DEVICESVALVES

4.1 SCOPE

This section provides requirements and guidelines that apply to repairs to pressure relief devices 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, A*ccreditation 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 devicevalve is considered to include the disassembly, replacement, remachining, or cleaning of any critical part, lapping of a seat and disc, replace o-ring and seals 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 3.2.5.2 a) or Part 2 Paragraph 2.5.7.2.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 pressure relief devicevalve'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 marked with the ASME Certification Mark and the "V", "UV", "UD" "HV", or "NV" Designator or the sup- planted ASME "V", "UV", "UD" "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. 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 device ~~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 device~~valve~~, the original device~~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 or pin 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 DEVICES ~~VALVES~~

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

4.3 MATERIALS FOR PRESSURE RELIEF DEVICE~~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 pressure relief device ~~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 pressure relief device~~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 pressure relief device~~valve~~ repair docu- ment (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 relief device~~valve~~ manufacturer (such as packing list) from the pressure relief device ~~valve~~ manufacturer or assembler of the pressure relief device~~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 pressure relief device~~valve~~ manu- facturer or assembler of the pressure relief device ~~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 pressure relief device~~valve~~ manufacturer and meets the manufacturer's accep- tance 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 DEVICE~~VALVES~~

When welding is used as a repair technique during a pressure relief device~~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 device~~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 device~~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.

4.4.4 WELDING RECORDS

The “VR” Certificate Holder shall maintain a record of the results obtained in welding procedure qualifications, except for those qualifications for which the provisions of 4.4.2 are used, and of the results obtained in welding performance qualifications. These records shall be certified by the “VR” Certificate Holder and shall be available to the National Board.

4.4.5 WELDER’S IDENTIFICATION

The “VR” 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 “VR” Certificate Holder shall also establish a written procedure whereby 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 shall be described in the quality control system written description. The welder’s or welding operator’s identifica- tion mark may be stamped (low stress stamp) adjacent to welded joints made by the individual, or the “VR” Certificate Holder may keep a documented record of welded joints and the welders or welding operators used in making the joints.

4.4.6 WELDER’S CONTINUITY

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

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 that supports the welding that is being performed shall be revoked. All other qualifications not questioned remain in effect.

4.4.7 WELD REPAIRS TO PRESSURE RELIEF DEVICE~~VALVE~~ PARTS BY AN “R” STAMP HOLDER

a) 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 this section provided the following documentation is provided to the “R” Certificate Holder:

   1) Code of construction, year built;

   2) Part identification;

   3) Part material specified; and

   4) “VR” Certificate Holder’s unique identifier for traceability as required by the repair inspection program.

b) Prior to performing weld repairs to pressure relief device~~valve (PRV)~~ parts, the “R” Certificate Holder shall receive repair information required by 4.4.7 a) from the “VR” Certificate Holder responsible for the pres- sure relief device~~valve~~ repair.

   1) Pressure relief device~~PRV~~ part weld repairs shall be performed under the “R” Certificate Holder’s quality system; how- ever, the requirements for in-process involvement of the Inspector (see Part 3, 2.2.2) may be waived. The requirement for stamping is waived.

   2) The process of identifying and controlling repairs shall be documented in the “R” Certificate Holder’s quality system.

3) Pressure relief device~~PRV~~ part repairs shall be documented on a Form R-1 with a statement under the "Remarks" section Pressure Relief Device~~"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 Pressure Relief Device ~~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 DEVICE~~VALVE~~ PERFORMANCE TESTING AND TESTING EQUIPMENT

Each pressure relief device~~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

Pressure relief devices~~Valves~~ marked for steam service, or having special internal parts for steam service, shall be tested on steam. Pressure relief devices~~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 pressure relief devices~~valves,~~ shall be tested on water, steam, or air.

a) Each pressure relief device~~valve~~ shall be tested to demonstrate the following:

1) Set pressure (as defined by the pressure relief device~~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 pressure relief devices~~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 pressure relief devices~~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 ASME CODE SECTION VIII STEAM TESTING

When ASME Code Section VIII pressure relief devices~~valves~~ are repaired by the owner for the owner's own use, pressure relief devices~~valves~~ for steam service may be tested on air for set pressure and, if possible, blowdown adjustment, provided the pressure relief device~~valve~~ man- ufacturer's corrections for differential in set pressure between steam and air are applied to the set pressure.

4.6.3 LIFT ASSIST TESTING

a) A device may be used to apply an auxiliary lifting load on the spring of a repaired pressure relief-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 mini- mum:

   1) Equipment utilized is calibrated as required in the quality system; including, but not limited to:

      a. System pressure measurement equipment;

      b. Lifting force measurement equipment; and

      c. Other measuring elements required by the device manufacturer.

   2) the device and test procedures that have proved to give accurate results are used and followed;

   3) A static inlet pressure is applied with the test medium specified in 4.6.1; and

4) Adjustments are made in accordance with the valve manufacturer's recommendations to ensure proper lift and blowdown.

c) 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 and provisions made to retain such documentation in accordance with Table 4.8.5.4 s). Documentation of this qualification shall include but not be limited to:

1) A description of the lift assist device including model number, serial number and manufacturer;

2) Size and pressure ranges of valves to be tested with the lift assist device and the test fluid to be used;

Note: Maximum set pressure is determined by available lift force and system pressure.

3) Accuracy of pressure measuring equipment; and

4) Method of qualifying.

d) After initial qualification of the device the device shall be re-qualified if:

1) Modifications or repairs to the device are made which would affect test results; or

2) The manufacturer issues a mandatory recall or modification to the device which will affect test results.

4.6.4 PRESSURE TEST OF PARTS

a) Parts used in repaired pressure relief devices ~~valves~~ shall be pressure tested and documentation provided according to the following categories:

1) Replacement Parts

The "VR" Certificate Holder is responsible for documentation that the appropriate pressure test has been completed as required by the original code of construction.

2) Parts Repaired by Welding

These parts shall be subjected to a pressure test required by the original code of construction. The "VR" Certificate Holder shall be responsible for documentation of such test.

b) Parts repaired by re-machining within part specifications, lapping, or polishing do not require a pressure test.

4.7 STAMPING REQUIREMENTS FOR PRESSURE RELIEF DEVICES

4.7.1 NAMEPLATES

Proper marking and identification of tested or repaired pressure relief devices ~~valves~~ is critical to ensuring acceptance during subsequent inspections, and also provide for traceability and identification of any changes made to the pressure relief device ~~valve~~. All operations that require the pressure relief device's ~~valve's~~ seals to be replaced shall be identified by a nameplate as described in 4.7.2 or 4.7.4.

(19) 4.7.2 REPAIR NAMEPLATE

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

a) Prior to attachment of the repair nameplate, the previous repair nameplate, if applicable, shall be removed from the repaired valve.

b) As a minimum, the information on the pressure relief device~~valve~~ repair nameplate (see Figure 4.7.2-a) shall include:

1) The name of the repair organization preceded by the words "repaired by";

2) The "VR" repair symbol stamp and the "VR" certificate number;

3) Unique identifier (e.g., repair serial number, shop order number, etc.);

4) Date of repair;

5) Set pressure;

6) Capacity and capacity units (if changed from original nameplate due to set pressure or service fluid change);

7) Type/Model number (if changed from original nameplate by a conversion. See 4.2); and

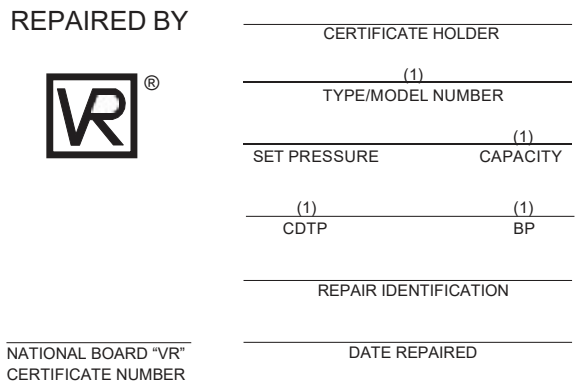
8) When an adjustment is made to correct for service conditions of superimposed back pressure and/or temperature or the differential between popping pressure between steam and air (see 4.6.2), the information on the valve repair nameplate shall include the:

a. Cold Differential Test Pressure (CDTP); and

b. Superimposed Back Pressure (BP) (only when applicable).

FIGURE 4.7.2-a

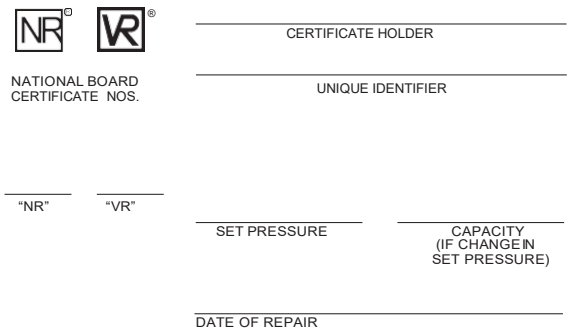
REQUIRED MARKINGS FOR REPAIR OF ASME/NATIONAL BOARD "V," "UV,", " UD" AND "HV"-STAMPED PRESSURE RELIEF DEVICES ~~VALVES~~



Note:. To be indicated only when changed.

FIGURE 4.7.2-b

REQUIRED MARKINGS FOR REPAIR OF NUCLEAR PRESSURE RELIEF DEVICES~~VALVES~~



4.7.3 CHANGES TO ORIGINAL PRESSURE RELIEF DEVICE~~VALVE~~ NAMEPLATE INFORMATION

a) If the set pressure is changed, the set pressure, capacity, and blowdown, if applicable, on the original nameplate or stamping shall be marked out but left legible. The new capacity shall be based on that for which the pressure relief device~~valve~~ was originally certified.

b) If the service fluid is changed, the capacity, including units, on the original nameplate or stamping shall be marked out but left legible. The new capacity shall be based on that for which the pressure relief device~~valve~~ was origi- nally certified, or if a conversion has been made, as described in 4.2 on the capacity certification for the pressure relief device ~~valve~~ as converted.

c) If the Type/Model number is changed, the Type/Model number on the original nameplate or stamping shall be marked out but left legible.

d) If the blowdown is changed, the blowdown, if shown on the original nameplate or stamping, shall be marked out but left legible. The new blowdown may be based on the current ASME Code requirements.

e) 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 REPLACEMENT OF ILLEGIBLE OR MISSING NAMEPLATES

a) Illegible Nameplates

When the information on the original manufacturer's or assembler's nameplate or stamping is illegible, but traceability can be confirmed, the nameplate or stamping shall be augmented by a nameplate furnished by the "VR" stamp holder stamped "Duplicate." It shall contain all information that originally appeared on the nameplate or pressure relief device ~~valve~~, as required by the applicable section of the ASME Code, except the "V," "HV," " UD" or "UV" symbol and the National Board mark. The repair organization's nameplate, with the "VR" stamp and other required data specified in 4.7.2, will make the repairer responsible to the owner and the Jurisdiction that the information on the duplicate nameplate is correct.

b) Missing Nameplates

When the original valve nameplate is missing, the repair organization is not authorized to perform repairs to the valve under the "VR" program, unless positive identification can be made to that specific valve and verification that the pressure relief device ~~valve~~ was originally stamped with an ASME "V" ~~,or~~ UV", " UD" symbol or marked with an ASME "HV" symbol. Valves that can be positively identified shall be equipped with a duplicate nameplate,

as described in this section, in addition to the repairer's "VR"-stamped nameplate. The repairer's responsibilities for accurate data, as defined in 4.7.5 a) shall apply.

c) Marking of Original Code Stamp

When a duplicate nameplate is affixed to a pressure relief device~~valve~~, as required by this section, it shall be marked "Sec. I," "Sec. IV," or "Sec. VIII," as applicable, to indicate the original ASME Code stamping.

(19) 4.7.5 REPLACEMENT OF ILLEGIBLE OR MISSING NAMEPLATES

a) Illegible Nameplates

When the information on the original manufacturer's or assembler's nameplate or stamping is illegi- ble, but traceability can be confirmed, the nameplate or stamping shall be augmented by a nameplate furnished by the "VR" stamp holder stamped "Duplicate." It shall contain all information that originally appeared on the nameplate or valve, as required by the applicable section of the ASME Code, except the ASME Certification Mark and the "V", "UV", UD or "HV" Designator or the supplanted "V", "UV",UD or "HV" symbol and the National Board mark. The repair organization's nameplate, with the "VR" stamp and other required data specified in 4.7.2, will make the repairer responsible to the owner and the Jurisdiction that the information on the duplicate nameplate is correct.

b) Missing Nameplates

When the original valve nameplate is missing, the repair organization is not authorized to perform repairs to the valve under the "VR" program, unless positive identification can be made to that specific valve and verification that the valve was originally marked with the ASME Certification Mark and the "V", "UV", or "HV" Designator or the supplanted ASME "V" , "UV" or "HV" symbol. Valves that can be positively identified shall be equipped with a duplicate nameplate, as described in this section, in addition to the repairer's "VR"-stamped nameplate. The repairer's responsibilities for accurate data, as defined in 4.7.5(a) (Illegible Nameplates), shall apply.

c) Marking of Original Code Stamp

When a duplicate nameplate is affixed to a valve, as required by this section, it shall be marked "Sec. I", "Sec. IV", or "Sec. VIII", as applicable, to indicate the original ASME Code marking.

4.8 ACCREDITATION OF "VR" REPAIR ORGANIZATIONS

4.8.1 SCOPE

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

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 devices~~valves~~ and National Board capacity certified pressure relief devices~~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, 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.

(19) 4.8.5.4 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 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 devices~~valves~~ that meet both ofthe following conditions:

a. Are marked with the ASME Certification Mark and the "V", "UV", "HV"," UD" 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 pressure reliefdevices~~valves'~~ condition and performance are equivalent to the standards for new pressure relief devices ~~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 the National Board for acceptance 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) 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 devices ~~valves~~. Repair procedures shall require verification that the critical parts meet the pressure relief device ~~valve~~ manufactur- er'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 pressure relief device~~valve~~ or group of pressure relief devices~~valves~~ shall be accompanied by the document referred to above for pro- cessing through the plant. Each pressure relief device ~~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 the ASME Code symbol stamping and the repair nameplate information, if applicable. In addition, it 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 nameplate 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 verifythat each step has been properly performed.

3) The system shall include a method of controlling the repair or replacement of critical pressure relief device~~valve~~ parts. The method of identifying each spring shall be indicated on the repair document describedin
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 device~~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 device~~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 section of the ASME Code.

k) Pressure Relief device ~~Valve~~ Testing, Setting, and Sealing

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

l) Pressure relief device~~Valve~~ Repair Nameplates

An effective pressure relief device~~valve~~ stamping system shall be established to ensure proper stamping of each pressure relief device~~valve~~ as re-
quired 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 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 written quality system manual to be submitted to the National Board; and

5) Revisions shall be submitted for acceptance by the National Board prior to being implemented.

o) Nonconformities

The 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,

TABLE 4.8.5.4 s)

Reports, Records, or Documents for "VR" Certificate Holders	Instructions	Minimum Retention Period
Form "R" reports associated with a pressure relief valve that required welding as part of the repair	Record retention shall be in accordance with Part 3, Table 1.5.1	Refer to Part 3, Table 1.5.1
Record of repair or inspection	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 devices~~valves~~.	5 years
Records related to equipment qualification and instrument calibration	Prior to use, all performancetesting equipment shall be qualified by the certificate holder to ensure that the equipment and testing procedures will provideaccurate 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.
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.
Records of employee training and qualification	Each repair organization shall establish minimum qualification requirements for those positions within the organization as they directly relate to pressure relief device~~valve~~ repair. Each repair organization shall document the evaluation and acceptance of an individual's qualification for the applicable position.	5 years after termination of employment.

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) Qualified technicians in the employ of the Certificate Holder perform such repairs;

b) An acceptable quality system covering field repairs, including field audits, 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.

4.8.6.1 AUDIT REQUIREMENTS

Upon issuance of a *Certificate of Authorization*, provided field repairs 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 4.6 of valve(s) that were repaired in the field. The audits shall be documented.

4.8.6.2 USE OF OWNER OR USER PERSONNEL

For the repair of pressure relief devices~~valves~~ at an owner or user's facility for the owner or user's own use, the "VR" Certificate Holder may utilize owner or user personnel to assist Certificate Holder technician(s) in the perfor- mance of repairs provided:

a) The use of such personnel is addressed in the "VR" Certificate Holder's quality system;

b) The owner or user personnel are trained and qualified in accordance with Supplement 3;

c) Owner or user personnel work under direct supervision and control of the "VR" Certificate Holder's technician(s) during any stage of the repair when they are utilized;

d) The "VR" Certificate Holder shall have the authority to assign and remove owner or user personnel at its own discretion; and

e) The names of the owner or user personnel utilized are recorded on the document as required for a quality system.

4.9 TRAINING AND QUALIFICATION OF PERSONNEL

4.9.1 CONTENTS OF TRAINING PROGRAM

The repair organization shall establish a documented in-house training program. This program shall establish training objectives and provide a method of evaluating training effectiveness. As a minimum, training objectives for knowledge level shall include:

a) Applicable ASME Code and NBIC requirements;

b) Responsibilities within the organization's quality system; and

c) Knowledge of the technical aspects and mechanical skills for the applicable position held.

SUPPLEMENT 3
GUIDE TO JURISDICTIONS FOR AUTHORIZATION OF OWNERS OR USERS TO MAKE ADJUSTMENTS TO PRESSURE RELIEF DEVICES~~VALVES~~

S3.1 GENERAL

The Jurisdiction may authorize properly trained and qualified employees of boiler and pressure vessel owners or users or their designees to confirm or restore set pressure shown on the unmodified original nameplate or stamping, or repair nameplate and/or performance of pressure relief devices~~valves~~. All external adjust- ments shall be resealed with a seal identifying the responsible organization and a metal tag that identifies the organization and the date the adjustment shall be installed.

S3.2 TRAINING

a) The user shall establish a documented in house training program. This program shall establish training objectives and provide a method of evaluating the training effectiveness. As a minimum, training objectives for knowledge level shall include:

1) Applicable ASME Code and NBIC requirements;

2) Responsibilities within the organization's quality system;

3) Knowledge of the technical aspects and mechanical skills for making set pressure and/or blowdown adjustments to pressure relief devices~~valves;~~ and

4) Knowledge of the technical aspects and mechanical skills for marking of pressure relief device ~~valve~~ adjustments.

b) If the user established a designee, the designee shall establish a training program and make their documentation available to the user and the Jurisdictional authority.

S3.3 DOCUMENTATION

Each user shall document the evaluation and acceptance of an employee's or designee's qualifications.

S3.4 QUALITY SYSTEM

a) A written quality system shall be established by either the user or the designee with a written description available to the Jurisdictional authority.

b) The written description shall include at a minimum:

1) Calibration of Test Equipment: This shall describe a system for the calibration of measuring and test equipment. Documentation of these calibrations shall include the standard used and the results. Calibration standards shall be calibrated against the equipment having valid relationships to nationally recognized standards.

2) Pressure relief device~~Valve~~ Testing, Setting, and Sealing: This 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 and S3.1.

3) Pressure relief device~~Valve~~ Marking: An effective marking system shall be established to ensure proper marking of the metal tag required by S3.1. The written quality system shall include a description or drawing of the metal tag.

S3.5 EXTERNAL ADJUSTMENTS

Only external adjustments to restore the set pressure shown on the unmodified original nameplate or stamping, or repair nameplate and/or performance of a pressure relief device~~valve~~ shall be made under the provi- sions of 2.2.5 and S3.1.

S3.6 REPAIRS

If disassembly, change of set pressure, or additional repairs are necessary, the valve shall be repaired by an organization that meets the requirements of the NBIC.

SUPPLEMENT 4
RECOMMENDED PROCEDURES FOR REPAIRING PRESSURE RELIEF VALVES

S4.1 INTRODUCTION

a) It is essential that the repair organization establish basic, specific procedures for the repair of pressure relief devicesvalves. The purpose of these recommended procedures is to provide the repair organization with guidelines for this important aspect of pressure relief devicevalve repair. It is realized that there are many types of pressure relief devicevalves and conditions under which they are repaired and, for this reason, the specific items in these recommended procedures may not apply, or they may be inadequate for each of those types or to the detailed repairs that may be required for each pressure relief device valve.

b) Prior to removal, repair, or disassembly of a pressure relief devicevalve ensure that all sources of pressure have been removed.

c) S4.2 contains recommended procedures for the repair of spring-loaded pressure relief devicevalves, and S4.3 contains recommended procedures for the repair of pilot operated types of pressure relief devicevalves. Infor- mation on packaging, shipping and transportation is included as S4.5.

S4.2 SPRING-LOADED PRESSURE RELIEF VALVES

a) Visual inspection as received

1) This information is to be recorded:

a. Record user (customer) identification number;

b. Complete original PRV nameplate data, previous repair nameplate data, plus any important information received from customer;

c. Check external adjustment seals for warranty repair;

d. Check bonnet for venting on bellows type valves; and

e. Check appearance for any unusual damage, missing, or misapplied parts.

2) If sufficient damage or other unusual conditions are detected that may pose a safety risk during preliminary testing, then proceed directly to S4.2 c).

3) Valves that are to be repaired in place proceed to S4.2 c) unless preliminary testing has been authorized by the owner.

b) Preliminary test as received

1) Information from the recommended preliminary performance test and subsequent disassembly and inspections will provide a basis for any repair interval change that should be necessary to ensure that the valve will function as intended.

2) Determine set pressure or Cold Differential Test Pressure (CDTP) in accordance with manufacturer's recommendations and appropriate ASME Code Section. Do not allow test pressure to exceed 116% of set pressure unless otherwise specified by the owner. A minimum of three tests is usually required to obtain consistent results.

3) If results do not correlate with field performance, then steps to duplicate field conditions (fluid and temperature) may be necessary.

4) Record preliminary test results and test bench identification data.

g) Nameplate

The repairer will place a repair nameplate on each repaired valve. The nameplate, as a minimum, shall meet the requirements of 4.7.1.

S4.4 Pin Devices:

Prior to removal of a valve from a system for a repair or any disassembly, ensure that all sources of pressure have been removed from the valve.

a) Visual inspection as received
   1. This information is to be recorded:
      a. Record user (customer) identification number.
      b. Complete original PRV nameplate data, previous repair nameplate data, plus any important information received from customer.
      c. Check tamper proof seals for warranty repair.
      d. Check bonnet top, columns and buckling pin screw for any damage or bending. Bent columns will result in a misalignment of the upper and lower pin holders and cause valve to malfunction and shall be removed from service.
      e. Check appearance for any unusual damage, missing, or misapplied parts per manufacturers assembly drawing. In addition, stroke the valve. Make sure the valve will fully lift. This must be full lift, if not go to S4.4 c) Disassembly.
   2. If sufficient damage or other unusual conditions are detected that may pose a safety risk during preliminary testing, then proceed directly to S4.4 c)
   3. Valves that are to be repaired in place proceed to S4.4 c) unless preliminary testing has been authorized by the owner.

b) Preliminary test as received
   1. Information from the recommended preliminary performance test and subsequent disassembly and inspections will provide a basis for any repair interval change that should be necessary to ensure that the valve will function as intended.
   2. The following tests shall be done on Pin Device.
      a. Measure lift force to move plug from closed position to open position. This can be done with pull gage or by using pressure WITHOUT pin.. Repeat 3 times and record the data. Review with manufacturer's original data.
      b. Reseat the plug fully into seat following manufacturer guidelines. Some manufacturers supply a tool for this purpose. This usually can be done by turning the adjuster Buckling Pin Screw on top by hand. If this cannot be done by hand, apply a torque wrench onto the pin adjuster hex and measure the torque required to fully seat. Compare the required torque to seat with manufacturer's original data.
      c. Conduct one(1) pop/opening tests using the manufacturer's pin designated for this specific valve. Do not allow test pressure to exceed 110% of set pressure unless otherwise specified by the owner.
   3. If test results from S4.4b) 2 are outside the manufacturer's recommendation, and pop tests are outside the ASME limits or agreed upon tolerance as stated on tag, proceed to S4.4 c) Disassembly.
   4. Record test results and test bench identification data.

c) Disassembly
   1. Remove Buckling Pin Protective Cage(screen), if applicable

2. Prior to any disassembly, ensure that the plug is re-seated following manufacurer guidelines . Reseating may require torque wrench as specified in S4.4b)2.a Once seated, remove any gag or shipping pin if applicable.

3. Remove the ASME seals on bonnet flange bolts, if applicable.

3.4. 4. Remove the bonnet flange bolts.

5. Remove the bonnet “Flange Assembly - with bonnet flange, columns, upper pin holder top and buckling pin adjuster screw”. Lift the bonnet Flange Assembly straight up vertically using a strap on the upper pin holder top.

6. Remove the bonnet/plug assembly out of seat using thread or nut on top of plug assembly. Be careful not to damage top of plug assembly where buckling pin sets.
    a. As the plug assembly is lifted out of body, handle the assembly carefully and lay it on clean surface. Be careful to not damage plug seat area during this step.

7. Remove the plug from the bonnet. Inspect all seals and replace per manufacturer’s instructions. Check bonnet bore for cleanliness and for wear and scratches. In the event there is minor scratches you may polish this bore. Pay special attention as not to remove material from this bore as this is a critical dimension.

8. Remove plug seat, if applicable, in body and clean and replace seals per manufacturer’s instructions.

d) Cleaning

1. Clean Adjusting screw or holding nut.
2. Thoroughly clean all small parts (Caution: do not use a cleaning method that will damage the parts.)
3. Do not clean in a chemical solution except under acceptable circumstances.
4. Protect seating surfaces and nameplates prior to cleaning.
5. Clean inside of valve body as needed.

e) Inspection

1. Check all parts for corrosion
2. Check nozzle for cracks (NDE as applicable) or unusual wear.
3. .Check plug and stem assembly for cracks (NDE as applicable) or unusual wear.
4. Check bonnet guide for wear
5. Check adjusting screw or holding nut free of galling or damage.
6. Check flange gasket facings for wear and cuts.
7. Check pin bearing points for fit and engagement.

f. Assembly

1. Intall the Seat to the body.
2. Install the plug back into bonnet with new seals and ensure plug is moving freely per manufacturer’s instructions. If moving freely install nut on the piston/plug and set aside for reinstalling the assembly back onto the valve body.
3. Install bonnet plug assembly back into the body carefully

4. Make sure the plug is inserted and fully seated into the plug seat and moving freely after installing the bonnet flange and tightening up the flange studs. This is where centering is very important to get the free movement of plug inside the plug seat per manufacturer's instructions
5. Use pressure for measuring the open pressure without pin. The manufacturer to supply the original manufacturer's load or pressure measurements

g. Testing

1. Test data shall be recorded. Testing will be done in accordance with manufacturer's recommendations and appropriate ASME Code section. To preclude unsafe and unstable valve operations or erroneous performance test results, it is recommended that low volume testing equipment (e.g., gas cylinders with- out a test vessel, hand pumps, tubing) should be avoided.

~~h.~~ h. Sealing

1. After final adjusting and acceptance by quality control inspection, all external adjustments shall be sealed with a safety seal providing a means of identification of the organization performing the repair.

i. Nameplate

1. The repairer will place a repair nameplate on each repaired valve. The nameplate shall, as a minimum, meet the requirements of 4.7.1.

j. Installation of new pin

a. For pin devices with shipping pins, with zero pressure on the inlet or outlet, the shipping pin shall be removed and replaced with pin tagged and traceable to the manufacturer and matches the set pressure, service and valve name plate information.

b. Install pins that are straight and without any deflection, visual defect or damage. c.

Ensure Pin device piston assembly moves freely without excessive resistance or force.

d. Piston assemble will be reseated and pin installed per manufacturer recommendations.

S4.~~5~~4 PACKAGING, SHIPPING AND TRANSPORTATION OF PRESSURE RELIEF DEVICES

a) The improper packaging, shipment, and transport of pressure relief devices can have detrimental effects on device operation. Pressure relief devices should be treated with the same precautions as instrumentation, with care taken to avoid rough handling or contamination prior toinstallation.

b) The following practices are recommended:

1) Pressure relief devices ~~Valves~~ should be securely fastened to pallets in the vertical position to avoid side loads on guiding surfaces except threaded and socket-weld pressure relief device ~~valves~~ up to NPS 2 (DN 50) may be securely packaged and cushioned during transport.

2) Pressure relief device~~Valve~~ inlet and outlet connection, drain connections, and bonnet vents should be protected during shipment and storage to avoid internal contamination of the valve. Ensure all covers and/or plugs are removed prior to installation.

3) The pressure relief device~~valve~~ should not be picked up or carried using the lifting lever. Lifting levers should be wired or secured so they cannot be moved while the valve is being shipped or stored. These wires shall be removed before the valve is placed in service.

4) Pilot valve tubing should be protected during shipment and storage to avoid damage and/or

breakage.

5) Pressure relief device~~Valves~~ for special services, including but not limited to oxygen, chlorine, and hydrogen perox- ide, should be packaged in accordance with appropriate standards and/or owner procurement requirements.

SUPPLEMENT 5

RECOMMENDED GUIDE FOR THE DESIGN OF A TEST SYSTEM FOR PRESSURE RELIEF DEVICES IN COMPRESSIBLE FLUID SERVICE

S5.1 SCOPE

This supplement provides guidance for the design of a test system using compressible fluids (e.g., steam or air/gas) and permits the determination of pressure relief devices ~~valve~~ set pressure and pressure relief valve ~~valve~~ operating characteris- tics such as blowdown.

The size of the test vessel needed depends on the size of the pressure relief device~~valve~~, its set pressure, the design of the test system, and whether blowdown must be demonstrated. A repair organization may use the information
provided in this supplement to determine the minimum size test vessel needed so that the measured performance is characteristic of the pressure relief device~~valve~~ and not the test system.

S5.2 GENERAL

a) The National Board administrative rules and procedures for the "VR" *Certificate of Authorization* and symbol stamp require that pressure relief device~~valves~~, after repair, be tested in accordance with the manu- facturer's recommendations and the applicable ASME Code. The purpose of this testing is to provide reasonable assurance that pressure relief device~~valves~~ will perform according to design when they are returned to service.

b) It is recognized that a full evaluation of the performance of some pressure relief device~~valve~~ designs requires testing at maximum allowable overpressure. However, it is beyond the scope of this supplement to define test equipment or facilities for such testing.

c) Section 6 of this part provides a glossary, S5.3 describes typical test equipment, and S5.4 provides data for estimating the size of test vessels required.

S5.3 TEST SYSTEM DESCRIPTION

a) An optimum configuration, particularly when the test medium source is of small capacity, is shown in Figure S5.3-a. The test medium flows from the pressure source, usually a compressor or boiler, to an accumulator. It then flows through a pressure-controlling valve into the test vessel, from which it is discharged, through the pressure relief device valve installed on the test vessel. The pressure-controlling valve is usually a globe valve, although ~~any~~ throttling valve is acceptable. If the pressure-controlling valve is of adequate size and can open quickly, large transient flows can be generated, increasing the pressure above the pressure relief device valve set pressure, causing it to lift, and be sustained in its liftedcondition.

b) Figure S5.3-b shows a simpler test system in which the test vessel is pressurized directly from the pressure source without the use of an accumulator. In this configuration, flow-rates through the pressure relief device valve and any consequent over-pressure are dependent on the flow generating capacity of the pr~~essure~~ source.

c) In a test facility, the pressure relief device valve is usually installed on an isolating valve that should be of suf- ficient size that it will not cho~~ke flow~~ to the pressure relief device valve. There should be no intervening piping between the two isolating and pressure relief ~~device~~ valves to avoid any significant inlet pressure drop between the test vessel and the pressure relief valve.

d) The isolating valve and any adapter flanges or pressure relief device valve test nozzles must be designed to sustain pressure relief valve discharge forces, and so secured that these forces are not transmitted to the test vessel. This is especially important for larger pressure relief device valves set at pressures greater than 100 psig (700 kPa).

e) The vessel should have a length-to-diameter ratio as low as is practical, and should be suitably

f) Pressure sensing lines should be connected to the test vessel well away from any inlet or outlet connections where pressure distortions due to transient changes in flow velocity during testing could cause erroneous pressure readings. When testing with steam, any water head that develops in the gage line must be taken into consideration.

g) Any intervening piping between the test vessel and the pressure relief valve should be as short and as straight as possible and be of adequate size to minimize inlet pressure drop.

h) In the case of steam, the equipment should be insulated and steam traps should be installed, as appropriate, to ensure that the test steam is dry, saturated steam with a minimum quality of 98%.

i) Pressure relief valves shall be used to protect the test vessel and the accumulator.

FIGURE S5.3-a
SCHEMATIC OF TEST EQUIPMENT WITH ACCUMULATOR

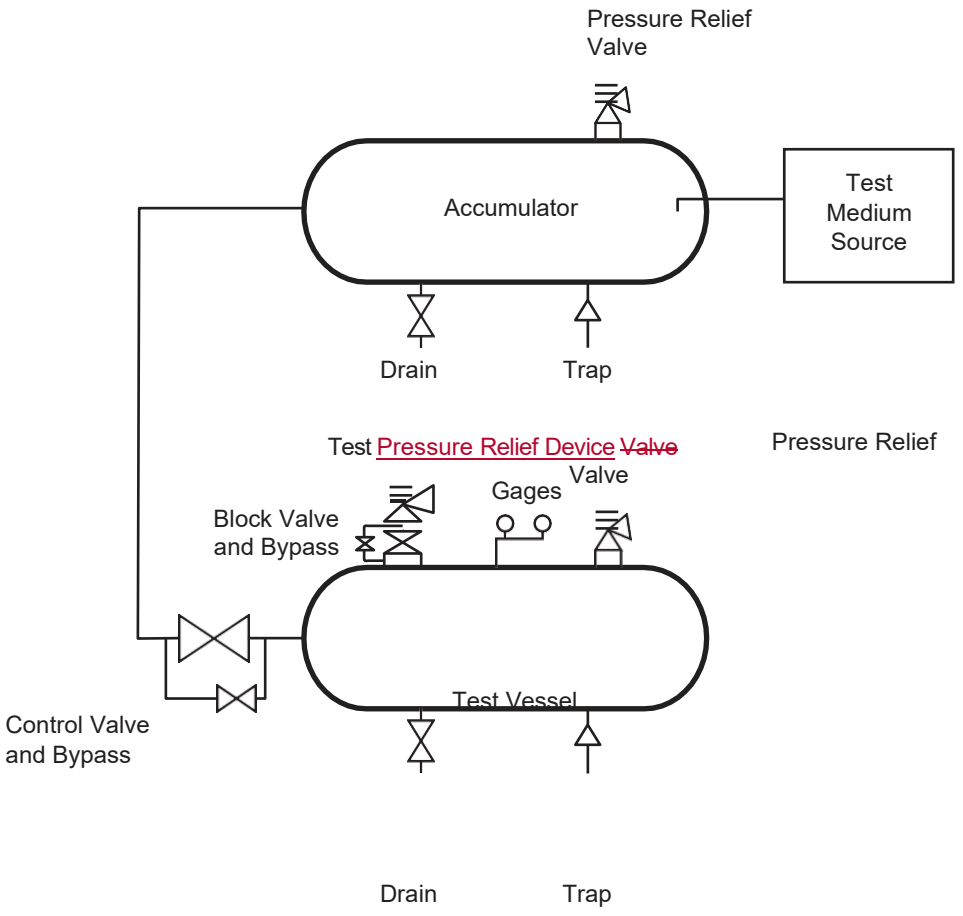
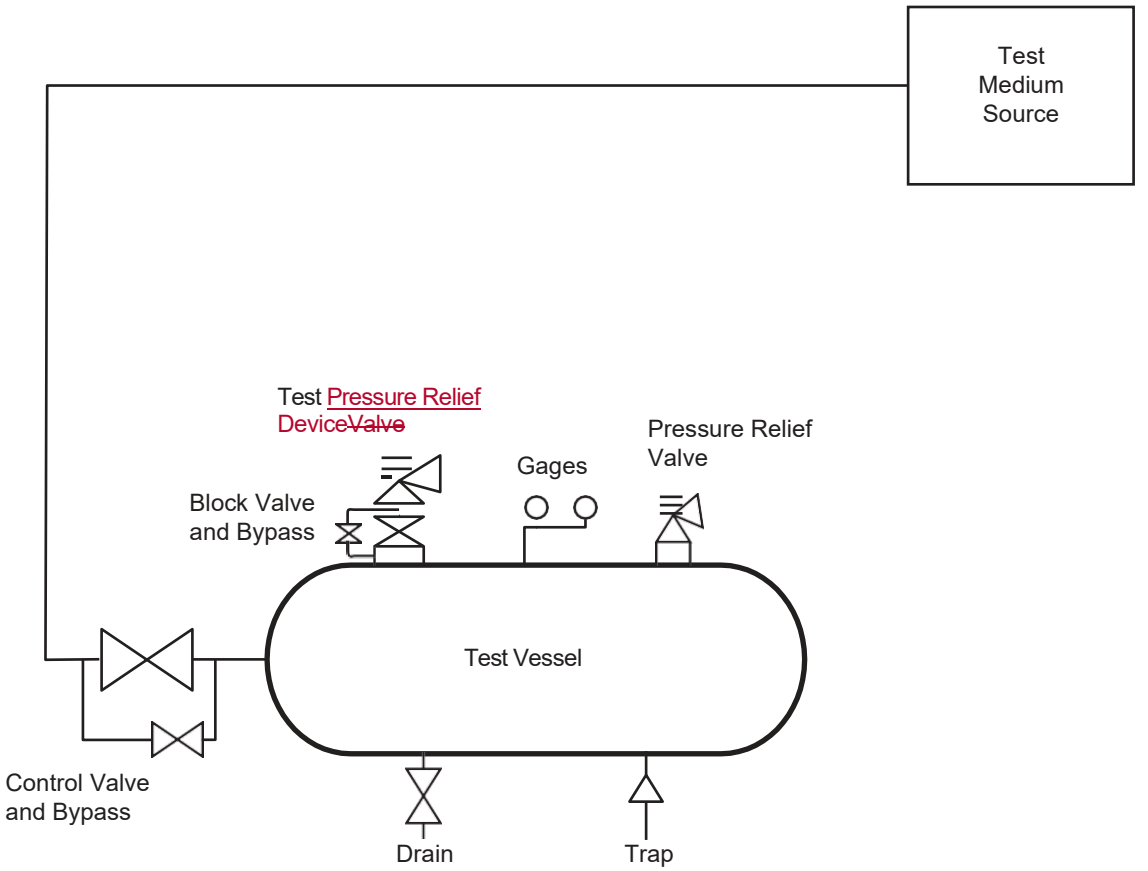


FIGURE S5.3-b

SCHEMATIC OF TEST EQUIPMENT WITHOUT ACCUMULATOR



S5.4 TEST VESSEL SIZING DATA

a) Recommended test vessel sizes are given in Figures S5.4-a and S5.4-b for a configuration using one vessel fed directly from the source of the test medium. Figure S5.3-a gives the test vessel size in ft^3 (m^3) vs. the valve orifice area in $in.^2$ (cm^2) for dry, saturated steam. Curves are shown for set pressures up to 500 psig (3.45MPa) for three different blowdowns: 4%, 7%, and 10%. The source is assumed to be capable of feeding the test vessel at 2500 lbs/hr. (1135 kg/hr). Figure S5.4-b gives similar curves for air with a source capable of feeding the test vessel at 200 ft^3/min (5.66m^3/min).

b) For pressure relief devices ~~valves~~, with effective orifices less than 1.28 $in.^2$ (826 mm^2), the size of the test vessel needed becomes less dependent on the flow capacity of the source. For these valves, a 15 $ft.^3$ (.425 m^3) min- imum size test vessel is recommended. This should allow the accurate measurement and setting of blowdown for small pressure relief valves. This minimum size should also be adequate for determining set pressures of larger pressure relief devices ~~valves~~; however, larger test vessels must be used if pressure relief valve blowdown is to be set accurately. It is recognized that there are practical limits on the size and maximum pressure of a test vessel used to demonstrate pressure relief device ~~valve~~ operational characteristics. In such cases, determination of pressure relief device~~valve~~ set pressure remains the only viable production and repair test option. The recommended minimum size test vessel (15 $ft.^3$ [0.425 m^3]) is normally adequate for this purpose.

National Board Commissioned Inspector — An individual who holds a valid and current National Board Commission.

NBIC — The *National Board Inspection Code* published by The National Board of Boiler and Pressure Vessel Inspectors.

Nuclear Items — Items constructed in accordance with recognized standards to be used in nuclear power plants or fuel processing facilities.

Original Code of Construction — Documents promulgated by recognized national standards writing bodies that contain technical requirements for construction of pressure-retaining items or equivalent to which the pressure-retaining item was certified by the original manufacturer.

Overfire Air — Air admitted to the furnace above the grate surface /fuel bed. Used to complete the combustion of fine particles, in suspension. Also aids in reducing NOx formation.

Owner or User — As referenced in lower case letters means any person, firm, or corporation legally responsible for the safe operation of any pressure-retaining item.

Owner-User Inspection Organization — An owner or user of pressure-retaining items that maintains an established inspection program, whose organization and inspection procedures meet the requirements of the National Board rules and are acceptable to the Jurisdiction or Jurisdictional Authority wherein the owner or user is located.

Owner-User Inspector — An individual who holds a valid and current National Board Owner-User Commission.

Piecing — A repair method used to remove and replace a portion of piping or tubing material with a suitable material and installation procedure.

Pilot Operated Pressure Relief Valve — A pressure relief valve in which the disk is held closed by system pressure, and the holding pressure is controlled by a pilot valve actuated by system pressure.

Pin Device: A pin device is a nonreclosing pressure relief device actuated by inlet static or differential pressure and designed to function by the activation of a load bearing section of a pin that supports a pressure-containing member. A pin is the load bearing activation component of a pin device its crosssectional area is not limited to a circular shape. A pin device body is the structure that encloses the pressure-containing members.

Plate Heat Exchanger (PHE) — An assembly of components consisting of heat transfer plates and their supporting frame. The frame provides structural support and pressure containment and may consist of fixed endplates, moveable endplates, an upper carrying bar and lower guide bar which provide plate alignment, and frame compression bolts.

Pneumatic Test — A pressure test which uses air or another compressible gas as the test medium.

Potable Water Heaters — A corrosion resistant appliance that includes the controls and safety devices to supply potable hot water at pressure not exceeding 160 psig (1,100 kPa) and temperature not in excess of 210°F (99°C).

Fired Storage Water Heater — A potable water heater in which water is heated by electricity, the combustion of solid, liquid, or gaseous fuels and stores water within the same appliance.

Indirect Fired Water Heater — A potable water heater in which water is heated by an internal coil or heat exchanger that receives its heat from an external source. Indirect fired water heaters provide water directly to the system or store water within the same appliance.

Circulating Water Heater — A potable water heater which furnishes water directly to the system or to a separate storage tank. Circulating water heaters may be either natural or forced flow.

Potable Water Storage Tank — an unfired pressure vessel used to store potable hot water at temperatures not exceeding 210°F (99°C).

Pressure Relief Device — A device designed to prevent pressure or vacuum from exceeding apredetermined value in pressure vessel by the transfer of fluid during emergency or abnormal conditions.

Pressure Relief Valve (PRV) — A pressure relief device designed to actuate on inlet static pressure and reclose after normal conditions have been restored.

Pressure-Retaining Items (PRI) — Any boiler, pressure vessel, piping, or material used for the containment of pressure, either internal or external. The pressure may be obtained from an external source, or by the application of heat from a direct source, or any combination thereof.

Pressure roll load — The terms line load, and nip load are used interchangeably to refer to the interaction between the pressure roll(s) and the Yankee dryer. It is called “nip” load because the pressure roll is rubber-covered and is pressed up against the Yankee with enough force to create a nip (or pinch) that forces the paper into line contact between the rolls and provides some mechanical dewatering. The paper then sticks onto the Yankee surface and follows the Yankee dryer for thermal dewatering by the steam-heated Yankee surface. This “nip load” is called a “line load” because the units are load (force) per length of line contact. The units are pounds per linear inch (PLI) and kilonewtons per meter (kN/m).

Pressure Test — A test that is conducted using a fluid (liquid or gas) contained inside a pressure-retaining item.

Pressure Vessel — A pressure vessel is a container other than a boiler or piping used for the containment of pressure.

“R” Certificate Holder — An organization in possession of a valid “R” *Certificate of Authorization* issued by the National Board.

Re-ending — A method used to join original code of construction piping or tubing with replacement piping or tubing material for the purpose of restoring a required dimension, configuration or pressure-retaining capacity.

Relief Valve — A pressure relief valve characterized by gradual opening that is generally proportional to the increase in pressure. It is normally used for incompressible fluids.

Repair — The work necessary to restore pressure-retaining items to a safe and satisfactory operating condition.

Re-rating (re-rate) — See alteration. Re-rate does not apply to pressure relief devices.

Regulatory Authority — A government agency, such as the United States Nuclear Regulatory Commission, empowered to issue and enforce regulations concerning the design, construction, and operation of nuclear power plants.

Safe Point of Discharge — A location that will not cause property damage, equipment damage, or create a health or safety threat to personnel in the event of discharge.

Safety Relief Valve — A pressure relief valve characterized by rapid opening or by gradual opening that is generally proportional to the increase in pressure. It can be used for compressible or incompressible fluids.

Safety Valve — A pressure relief valve characterized by rapid opening and normally used to relieve compressible fluids.

Seal Weld — Any weld designed primarily to provide a specific degree of tightness against leakage. A seal weld is not intended to provide structural integrity to a pressure retaining item.

Settings — Those components and accessories required to provide support for the component during operation and during any related maintenance activity.

Shop — A permanent location, the address that is shown on the *Certificate of Authorization*, from which a Certificate Holder controls the repair and/or alteration of pressure-retaining items.

ITEM 19-83 Proposal 1/7/21

NBIC PART 1

3.9 PRESSURE RELIEF VALVES

See NBIC Part 1, 3.2 for the scope of pressure retaining items covered by these requirements.

3.9.1 PRESSURE RELIEF VALVE REQUIREMENTS – GENERAL

The following general requirements pertain to installing, mounting, and connecting pressure relief valves on heating boilers.

3.9.1.1 INSTALLATION OF PRESSURE RELIEF VALVES FOR STEAM HEATING, HOTWATER HEATING, AND HOT-WATER SUPPLY BOILERS

3.9.1.1.1 PERMISSIBLE INSTALLATION

Pressure relief valves shall be located at the top side of the boiler. The top side of the boiler shall mean the highest practicable part of the boiler proper but in no case shall the safety valves be located below the normal operating level and in no case shall the pressure relief valve be located below the lowest permissible water level. They shall be connected directly to a tapped or flanged opening in the boiler, to a fitting connected to the boiler by a short nipple, to a Y-base, or to a valveless header connecting steam or water outlets on the same boiler. Coil or header type boilers shall have the pressure relief valve located on the steam or hot-water outlet end. Pressure relief valves shall be installed with their spindles vertical. The opening or connection between the boiler and any pressure relief valve shall have at least the area of the valve inlet.

a) For a Low Mass Watertube boiler of 10 gallons or less, the pressure relief valve may be installed below the boiler provided:

1) A UL-353 certified flow sensing device is installed to automatically cut off the fuel supply if circulation through the boiler is interrupted;

2) The pressure relief valve is installed with the spindle in the vertical position;

3) The opening or connection between the boiler and the pressure relief valve shall have an area at least equal to the nominal inside area of a Schedule 80 pipe (as defined by ASME B36.10) and of the same nominal pipe size as the inlet of the valve.

3.9.4 PRESSURE RELIEF VALVE REQUIREMENTS FOR POTABLE WATER HEATERS

a) Each water heater shall have at least one National Board capacity certified temperature and pressure relief valve. No temperature and pressure relief valve shall be smaller than NPS 3/4 (DN 20).

b) The pressure setting shall be less than or equal to the maximum allowable working pressure of the water heater. However, if any of the other components in the hot-water supply system (such as valves, pumps, expansion or storage tanks, or piping) have a lesser working pressure rating than the water heater, the pressure setting for the temperature and pressure relief valve(s) shall be based upon the component with the lowest maximum allowable working pressure rating. If more than one temperature

and pressure relief valve is used, the additional valve(s) may be set within a range not to exceed 10% over the set pressure of the first valve.

c) The required relieving capacity in Btu/hr (W) of the temperature and pressure relief valve shall not be less than the maximum allowable input unless the water heater is marked with the rated burner input capacity of the water heater on the casing in a readily visible location, in which case the rated burner input capacity may be used as a basis for sizing the temperature pressure relief valves. The relieving capacity for electric water heaters shall be 3,500 Btu/hr (1.0 kW) per kW of input. In every case, the following requirements shall be met. Temperature and pressure relief valve capacity for each water heater shall be such that with the fuel burning equipment installed and operated at maximum capacity, the pressure cannot rise more than 10% above the maximum allowable working pressure.
Many temperature and pressure relief valves have a National Board capacity certified rating which was determined according to ASME Code requirements, and a lower Canadian Standards Association (CSA) rating value. Where the ASME Code is the only referenced code of construction the National Board capacity certified rating may be used. If the water heater is not an ASME vessel, or the CSA rating is required by another standard (such as a plumbing or building code) then that rating shall be used.

d) If operating conditions are changed or additional heating surface is installed, the temperature and pressure relief valve capacity shall be increased, if necessary, to meet the new conditions and shall be in accordance with the above provisions. In no case shall the increased input capacity exceed the maximum allowable input capacity. The additional valves required, on account of changed conditions, may be installed on the outlet piping providing there is no intervening valve.

3.9.4.1 INSTALLATION

Temperature and pressure relief valves shall be installed by either the water heater manufacturer or installer before a water heater is placed in operation.

3.9.4.2 PERMISSIBLE INSTALLATIONS

Temperature and pressure relief valves shall be connected directly to a tapped or flanged opening in the top of the water heater or to a fitting connected to the water heater by a short nipple. Temperature and pressure relief valves shall be installed with their spindles upright and vertical with no horizontal connecting pipe, except that, when the temperature and pressure relief valve is installed directly on the water heater vessel with no more than 4 in. (100 mm) maximum interconnecting piping, the valve may be installed in the horizontal position with the outlet pointed down. The center line of the temperature and pressure relief valve connection shall be no lower than 4 in. (100 mm) from the top of the shell. No piping or fitting used to install the temperature and pressure relief valve shall be of nominal pipe size less than that of the valve inlet.

a) For a Low Mass Watertube boiler of 10 gallons or less, the pressure relief valve may be installed below the boiler provided:

1) A UL-353 certified flow sensing device is installed to automatically cut off the fuel supply if circulation through the boiler is interrupted;

2) The pressure relief valve is installed with the spindle in the vertical position;

3) The opening or connection between the boiler and the pressure relief valve shall have an area at least equal to the nominal inside area of a Schedule 80 pipe (as defined by ASME B36.10) and of the same nominal pipe size as the inlet of the valve.

NBIC PART 4

2.4 PRESSURE RELIEF VALVES FOR STEAM HEATING, HOT WATER HEATING, AND HOT WATER SUPPLY BOILERS

See NBIC Part 1, 3.2 for the scope of pressure retaining items covered by Part 4, 2.4.

2.4.1 GENERAL REQUIREMENTS

The following general requirements pertain to the installation of pressure relief valves on heating boilers.

2.4.1.1 INSTALLATION OF PRESSURE RELIEF VALVES FOR HEATING BOILERS

2.4.1.1.1 PERMISSIBLE INSTALLATION

Pressure relief valves shall be located at the top side of the boiler. The top side of the boiler shall mean the highest practicable part of the boiler proper but in no case shall the safety valves be located below the normal operating level and in no case shall the pressure relief valve be located below the lowest permissible water level. They shall be connected directly to a tapped or flanged opening in the boiler, to a fitting connected to the boiler by a short nipple, to a Y-base, or to a valveless header connecting steam or water outlets on the same boiler. Coil or header type boilers shall have the pressure relief valve located on the steam or hot-water outlet end. Pressure relief valves shall be installed with their spindles vertical. The opening or connection between the boiler and any pressure relief valve shall have at least the area of the valve inlet.

a) For a Low Mass Watertube boiler of 10 gallons or less, the pressure relief valve may be installed below the boiler provided:

1) A UL-353 certified flow sensing device is installed to automatically cut off the fuel supply if circulation through the boiler is interrupted;

2) The pressure relief valve is installed with the spindle in the vertical position;

3) The opening or connection between the boiler and the pressure relief valve shall have an area at least equal to the nominal inside area of a Schedule 80 pipe (as defined by ASME B36.10) and of the same nominal pipe size as the inlet of the valve.

2.4.4 PRESSURE RELIEF VALVE REQUIREMENTS FOR POTABLE WATER HEATERS

a) Each water heater shall have at least one National Board capacity certified temperature and pressure relief valve. No temperature and pressure relief valve shall be smaller than NPS 3/4 (DN 20).

b) The pressure setting shall be less than or equal to the maximum allowable working pressure of the water heater. However, if any of the other components in the hot-water supply system (such as valves, pumps, expansion or storage tanks, or piping) have a lesser working pressure rating than the water heater, the pressure setting for the temperature and pressure relief valve(s) shall be based upon the component with the lowest maximum allowable working pressure rating. If more than one temperature and pressure relief valve is used, the additional valve(s) may be set within a range not to exceed 10% over the set pressure of the first valve.

c) The required relieving capacity in Btu/hr (W) of the temperature and pressure relief valve shall not be less than the maximum allowable input unless the water heater is marked with the rated burner input capacity of the water heater on the casing in a readily visible location, in which case the rated burner input capacity may be used as a basis for sizing the temperature pressure relief valves. The relieving capacity for electric water heaters shall be 3,500 Btu/hr (1.0 kW) per kW of input. In every case, the following requirements shall be met. Temperature and pressure relief valve capacity for each water heater shall be such that with the fuel burning equipment installed and operated at maximum capacity, the pressure cannot rise more than 10% above the maximum allowable working pressure.
Many temperature and pressure relief valves have a National Board capacity certified rating which was determined according to ASME Code requirements, and a lower Canadian Standards Association (CSA) rating value. Where the ASME Code is the only referenced code of construction the National Board capacity certified rating may be used. If the water heater is not an ASME vessel, or the CSA rating is required by another standard (such as a plumbing or building code) then that rating shall be used.

d) If operating conditions are changed or additional heating surface is installed, the temperature and pressure relief valve capacity shall be increased, if necessary, to meet the new conditions and shall be in accordance with the above provisions. In no case shall the increased input capacity exceed the maximum allowable input capacity. The additional valves required, on account of changed conditions, may be installed on the outlet piping providing there is no intervening valve.

2.4.4.1 INSTALLATION

Temperature and pressure relief valves shall be installed by either the water heater manufacturer or installer before a water heater is placed in operation.

2.4.4.2 PERMISSIBLE INSTALLATIONS

Temperature and pressure relief valves shall be connected directly to a tapped or flanged opening in the top of the water heater or to a fitting connected to the water heater by a short nipple. Temperature and pressure relief valves shall be installed with their spindles upright and vertical with no horizontal connecting pipe, except that, when the temperature and pressure relief valve is installed directly on the water heater vessel with no more than 4 in. (100 mm) maximum interconnecting piping, the valve may be installed in the horizontal position with the outlet pointed down. The center line of the temperature and pressure relief valve connection shall be no lower than 4 in. (100 mm) from the top of the shell. No piping or fitting used to install the temperature and pressure relief valve shall be of nominal pipe size less than that of the valve inlet.

a) For a Low Mass Watertube boiler of 10 gallons or less, the pressure relief valve may be installed below the boiler provided:

1) A UL-353 certified flow sensing device is installed to automatically cut off the fuel supply if circulation through the boiler is interrupted;

2) The pressure relief valve is installed with the spindle in the vertical position;

3) The opening or connection between the boiler and the pressure relief valve shall have an area at least equal to the nominal inside area of a Schedule 80 pipe (as defined by ASME B36.10) and of the same nominal pipe size as the inlet of the valve.

NBIC ITEM NO: 19-83
SCOPE: ADDRESS ALTERNATE PRV MOUNTING PERMITTED BY ASME CC 2887-1.

Approval Date: December 12, 2017

Code Cases will remain available for use until annulled by the applicable Standards Committee.

Case 2887-1
Alternate Safety Relief Valve Mounting for Low Mass Watertube Boilers and Water Heaters
Section IV

Inquiry: Under what conditions may safety relief valves be mounted below a low mass watertube boiler or water heater?

Reply: It is the opinion of the Committee that safety relief valves may be mounted below a low mass watertube boiler or water heater, provided the following requirements are met:

(a) Water volume shall be 10 gal (38 L) or less.

(b) A UL-353 certified flow sensing device shall be installed to automatically cut off the fuel supply if circulation through the boiler is interrupted.

(c) The safety relief valve inlet piping is connected to a vertical section of the hot water outlet piping (see Figure 1).

(d) Safety relief valves shall be installed with their spindles vertical.

(e) The opening or connection between the boiler and any safety relief valve shall have an area at least equal to the nominal inside area of a Schedule 80 pipe (as defined by ASME B36.10) and of the same nominal pipe size as the inlet of the valve.

(f) All other requirements of Section IV shall be met.

(g) This Case number shall be recorded on the Manufacturer's Data Report.

TASK GROUP:
D. MAREK (ch)
T. PATEL, J. BALL

Item 21-05. Develop Implementation Audit

Initial Language:

4.8.5.4 r) Field Repairs

If field repairs are 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 receipt and inspection of replacement parts, including parts received from the owner-user, shall be addressed;

3) If owner-user personnel will assist with repairs, provisions for the use of owner user personnel shall be included; and

4) Provisions for use of owner-user measurement and test equipment, if applicable, shall be addressed.

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:

1) Qualified technicians in the employ of the Certificate Holder perform such repairs;

2) An acceptable quality system covering field repairs, including field audits, is maintained; and

3) Functions affecting the quality of the repaired valves are supervised from the address of record where the "VR" certification is issued.

4.8.6.1 AUDIT REQUIREMENTS

Upon issuance of a *Certificate of Authorization*, provided field repairs 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 4.6 of valve(s) that were repaired in the field. The audits shall be documented.

Proposed Language:

4.8.5.4 r) Field Repairs

If field repairs are 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)~~1) Provisions for receipt and inspection of replacement parts, including parts received from the owner-user, shall be addressed;

~~3)~~2) If owner-user personnel will assist with repairs, provisions for the use of owner user personnel shall be included; and

~~4)~~3) Provisions for use of owner-user measurement and test equipment, if applicable, shall be addressed.

Table 4.8.5.4 (s) Addition:

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. ~~The exclusions as well as audit results shall be documented.~~	5 Years

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:

1) Qualified technicians in the employ of the Certificate Holder perform such repairs;

2) An acceptable quality system covering field repairs~~, including field audits,~~ is maintained; and

3) Functions affecting the quality of the repaired valves are supervised from the address of record where the "VR" certification is issued.

~~**4.8.6.1 AUDIT REQUIREMENTS**~~

~~Upon issuance of a *Certificate of Authorization*, provided field repairs 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 4.6 of valve(s) that were repaired in the field. The audits shall be documented~~

4.11 Annual Audits.

Upon Issuance of a Certificate of Authorization, the repair organization shall audit the Quality System of the repair program on an annual basis. The quality manual shall define the auditing criteria, scope, frequency, and methods to ensure the requirements of the NBIC and Certificate Holder's Quality System are effectively implemented. The scope shall include but not be limited to:

a) Drawing and Specification Control 4.8.5.4 (g)

b) Material and Part Control 4.3 & 4.8.5.4 (h)

c) Repair and Inspection Program 4.8.5.4 (i)

d) Welding, NDE and Heat Treatment 4.8.5.4 (j) (when ~~applicable~~[DA1] in scope)

e) Valve Testing, Setting, and Sealing 4.8.5.4 (k)

f) Valve Repair Name Plates 4.8.5.4 (l)

g) Calibration 4.8.5.4 (m)

h) Manual and Documentation Control 4.8.5.4 (n)

i) Nonconformities 4.8.5.4 (o)

j) Testing Equipment 4.8.5.4 (q)

k) Field Repair 4.8.5.4 (r) (when in scope)[DA2]

l) Record Retention 4.8.5.4 (s)

m) Competency, Training & Qualification of Personnel 4.9

n) Use of Personnel not in the Certificate Holder's employ 4.10[DA3]

The audit results shall be documented. Mandatory items ~~outside~~ in the repair organization's scope ~~or items~~ [DA4]that have not been performed during the annual audit period shall be documented as exceptions in the audit results.

PROPOSED REVISION OR ADDITION

Item No.

21-18

Subject/Title

Pressure Tests for Pressure Relief Valve Repair Parts

NBIC Location

Part: Pressure Relief Devices; Section: 4.6.4; Paragraph: a) 1)

Project Manager and Task Group

Source (Name/Email)

Denis DeMichael / Denis.B.DeMichael@chemours.com

Statement of Need

Pressure relief valve manufacturers must produce valve parts that comply with ASME Code requirements to be able to apply the ASME Symbol Stamp and Designator to a new valve. These parts are the same that are sold as repair parts. The logistic issues to fabricate and maintain an inventory of spare parts not complying with ASME Code requirements is significant versus producing all parts in compliance with code. Consequently, why have a pressure test requirement for parts purchased from the valve manufacturer for those certificate holders who chose to buy parts produced by the manufacturer?

Background Information

See Statement of Need.

Existing Text

The “VR” Certificate Holder is responsible for documentation that the appropriate pressure test has been completed as required by the original code of construction.

Proposed Text

Unless the part is fabricated by the valve manufacturer, the “VR” Certificate Holder is responsible for documentation that the appropriate pressure test has been completed as required by the original code of construction.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

CODE REVISIONS OR ADDITIONS

Request for code revisions or additions shall provide the following:

a) Proposed Revisions or Additions
For revisions, identify the rules of the code that require revision and submit a copy of the appropriate rules as they appear in the code, marked up with the proposed revision. For additions, provide the recommended wording referenced to the existing code rules.

b) Statement of Need
Provide a brief explanation of the need for the revision or addition.

c) Background Information
ide background information to support the revision or addition, including any data or changes in nology that form the basis for the request that will allow the Committee to adequately evaluate the osed revision or addition. Sketches, tables, figures, and graphs should be submitted as appropriate. n applicable, identify any pertinent paragraph in the code that would be affected by the revision or tion and identify paragraphs in the code that reference the paragraphs that are to be revised or added.

PROPOSED REVISION OR ADDITION

Item No.

A 21-36

Subject/Title

Add Test Details to NBIC Part 4, 3.3.3.4 i) Valve Adjustment and Sealing

NBIC Location

Part: Pressure Relief Devices & Pressure Relief Devices; Section: 3. & 3.; Paragraph: 3.3.3.4 i) & 3.3.3.4 i) 1)

Project Manager and Task Group

Source (Name/Email)

J. Alton Cox / alton@jaltoncox.com

Statement of Need

There is no reference in the T/O requirements for Set Pressure Testing, use of proper Test Fluid or Seat Tightness unless and until a minor adjustment is required. This is surely the intent, but it is not clearly specified as it is in the current VR requirements.

Background Information

With regard to Test Only (T/O), NBIC Part 4 currently references portions of NBIC Part 4, Para. 3.2.5 for minor adjustment and use of a Lift Assist Device. NBIC Part 4, Para. 3.2.5 in portions not referred to by 3.3.3.4 recommends Set Pressure & Seat Tightness, but does not require either. Should rather than Shall is the current wording.

Existing Text

Proposed Text

3.3.3.4 i) Valve Testing, Adjustment, and Sealing 3.3.3.4.i) 1) The system shall include provisions that each pressure relief valve shall be tested in accordance with 4.6.1 a). Each pressure relief valves requiring adjustment as permitted by 3.2.5.2 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 and the NBIC.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

ITEM 21-49 Proposal 10/5/21

NBIC Part 4 Paragraph 3.3.3.4

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) 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 ~~for acceptance~~ before implementation.

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;

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 ~~for acceptance prior to implementation~~; and

5) Revisions shall be submitted for to and accepted by ~~acceptance by~~ the National Board prior to being implemented.

NBIC Part 4 Paragraph 4.8.5.4

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. 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 ~~for acceptance~~ before implementation.

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 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

5) Revisions shall be submitted to and accepted by the National Board prior to being implemented.

ITEM 21-51 Proposal 10-5-21

SUPPLEMENT 3
PRESSURE RELIEF AND PILOT VALVE STORAGE & SHELF LIFE

S3.1 SCOPE
This supplement provides guidance for proper conditions and duration of pressure relief valve storage. This guidance applies to pressure relief valves, temperature & pressure relief valves, and pilot operated pressure relief valves (including the main body valve and the pilot valve).

S3.2 PRESSURE RELIEF VALVE STORAGE
Pressure relief valve set pressure and/or seat tightness can deviate during storage. The manufacturer's recommendations should be followed regarding shelf life. In some cases, it may be necessary to retest the pressure relief valve prior to installation or reduce maintenance interval if the pressure relief valve was in storage for an extended period. When storing pressure relief valves, a first in / first out policy should be followed.

S3.3 PRESSURE RELIEF VALVE STORAGE CONDITIONS
Pressure ~~R~~relief valves should be stored per manufacturer recommendations. Storage temperature should be within the operating or storage temperature range provided by the manufacturer. Where the manufacturer has no recommendations, the following guidelines should be followed.

a) Storage temperature should be between 40 and 72 °F, where practical.
b) Ideal relative humidity in the storage area should be 70 percent or less. For pressure relief valves with soft seats, relative humidity should be kept between 30 and 70 percent. Some soft materials require a minimum humidity level to prevent material degradation.
c) Storage area should have a non-corrosive atmosphere. Otherwise, stored pressure relief valves should be protected from the atmosphere.
d) Pressure ~~R~~relief valves that utilize spindles or weights should be stored in a vertical position.
e) Temperature and pressure relief valves should have their probes supported to prevent bending or detachment.
f) All ports should be plugged, blanked, or capped.
g) Pressure ~~R~~relief valves that have been cleaned for oxidizing gas or other specialty service should be sealed in a plastic bag. Plastic wrapping may be acceptable for larger pressure relief valves.
h) Storage should be off the ground (e.g. on a shelf or pallet).
i) Storage area should limit exposure to direct sunlight
j) Pressure ~~R~~relief valves constructed of materials subject to corrosion (such as carbon steel) should be painted or otherwise protected against the environment prior to storage.

S3.4 PRESSURE RELIEF VALVE SHELF LIFE
Pressure Relief valve shelf life shall be determined based upon manufacturer's recommendations and performance history. Shelf life may increase or decrease based upon storage conditions and performance history. In the absence of manufacturer or service provider recommendations, and performance history, the shelf life recommendations per table S3.4 should be used when stored in accordance with S3.3. Shelf life may be increased or decreased, from the recommended values, once performance history is established.

TABLE S3.4

RECOMMENDED PRESSURE RELIEF VALVE SHELF LIFE (IF NOT PROVIDED BY MANUFACTURER)

Pressure Relief Valve Description/Recommended Shelf Life (years)

Temperature and pressure relief valve/2

Pressure relief valve with metal-to-metal seat/5

Pressure relief valve with nonmetal seat/2

S3.4.1 EXCEEDING SHELF LIFE

If shelf life is exceeded, the pressure relief valve shall either be tested prior to installation or tested using its lift lever (if applicable) following installation. Storage for a length of time less than the shelf life of the pressure relief valve does not reduce the time before the first regularly scheduled retest. If performance history shows that time in storage less than shelf life causes the device to function outside of acceptable tolerance, then the shelf life shall be reduced.

ITEM 21-52

Part 4 Paragraph 2.5.3

2.5.3 LOCATION

a) The pressure relief device shall be installed directly on the pressure vessel, unless the source of pressure is external to the vessel and is under such positive control that the pressure cannot exceed the maximum overpressure permitted by the original code of construction and the pressure relief device cannot be isolated from the vessel, except as permitted by 2.5.6 e).~~ 2)~~

Part 1 Paragraph 4.5.3

4.5.3 LOCATION

a) The pressure relief device shall be installed directly on the pressure vessel, unless the source of pressure is external to the vessel and is under such positive control that the pressure cannot exceed the maximum overpressure permitted by the original code of construction and the pressure relief device cannot be isolated from the vessel, except as permitted by 4.5.6 e).~~ 2)~~

PROPOSED REVISION OR ADDITION

Item No.

A 21-63

Subject/Title

Require unique identifier marked on Pilots in addition to main valves

NBIC Location

Part: Pressure Relief Devices; Section: 4; Paragraph: 4.7.2

Project Manager and Task Group

Source (Name/Email)

Thomas Beirne / tbeirne@nationalboard.org

Statement of Need

The 2021 Edition of ASME BPVC Section XIII requires pilots of pilot operated pressure relief valves be marked with a unique identifier that matches the main valve (Section I has similar approved text for the 2023 Edition). This should be addressed for VR nameplates as well since pilots can be replaced as VR operation.

Background Information

See statement of need.

Existing Text	Proposed Text
	Add a subparagraph c) to paragraph 4.7.2 to address a separate nameplate marking requirements for the pilot of pilot operated pressure relief valve.

	VOTE:						
COMMITTEE	Approved	Disapproved	Abstained	Not Voting	Passed	Failed	Date

ITEM 21-72 Proposal 11/10/21

4.7.2 REPAIR NAMEPLATES

When a pressure relief valve is repaired, a metal repair nameplate stamped with the information required below shall be securely attached to the valve adjacent to the original manufacturer's stamping or 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) Prior to attachment of the repair nameplate, the previous repair nameplate, if applicable, shall be removed from the repaired valve.

b) As a minimum, the information on the valve repair nameplate (see Figure 4.7.2-a) shall include:

1) The name of the repair organization preceded by the words "repaired by";
2) The "VR" repair symbol stamp and the "VR" certificate number;
3) Unique identifier (e.g., repair serial number, shop order number, etc.);
4) Date of repair;
5) Set pressure;
6) Capacity and capacity units (if changed from original nameplate ~~due to set pressure or service fluid change~~);
7) Type/Model number (if changed from original nameplate ~~by a conversion. See 4.2~~); and
8) When an adjustment is made to correct for service conditions of superimposed back pressure and/ or temperature, the information on the valve repair nameplate shall include the:
    a. Cold Differential Test Pressure (CDTP); and
    b. Superimposed Back Pressure (BP) (only when applicable).

ITEM 21-73 Proposal 11/10/21

4.7.3 CHANGES TO ORIGINAL PRESSURE RELIEF VALVE NAMEPLATE INFORMATION

a) If changes are required to be made to the information on the original nameplate or stamping, that information 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. ~~If the set pressure is changed, the set pressure, capacity, and blowdown, if applicable, on the original nameplate or stamping shall be marked out but left legible. The new capacity shall be based on that for which the valve was originally certified.~~

~~b) If the service fluid is changed, the capacity, including units, on the original nameplate or stamping shall be marked out but left legible. The new 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.~~

~~c) If the Type/Model number is changed, the Type/Model number on the original nameplate or stamping shall be marked out but left legible.~~

~~d) If the blowdown is changed, the blowdown, if shown on the original nameplate or stamping, shall be marked out but left legible. The new blowdown may be based on the current ASME Code requirements.~~

~~e~~b) 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.

ITEM 21-76 Proposal 12/13/21

PART 4,

3.2.4.3 PRESSURE VESSELS AND PIPING

Standard practice for overpressure protection devices is to not permit any type of isolation valve either before or after the device. However, some pressure vessel standards permit isolation valves under certain controlled conditions when shutting down the vessel to repair a damaged or leaking valve. If isolation block valves are employed, their use should be carefully controlled by written procedures. Block valves should have provisions to be either car-sealed or locked in an open position when not being used. For ASME Section VIII, Div. 1 pressure vessels, see UG-~~135~~156, Appendix M, and Jurisdictional rules for more information.

PART 2,

2.5.5.3 PRESSURE VESSELS AND PIPING

Standard practice for overpressure protection devices is to not permit any type of isolation valve either before or after the device. However, some pressure vessel standards permit isolation valves under certain controlled conditions when shutting down the vessel to repair a damaged or leaking valve. If isolation block valves are employed, their use should be carefully controlled by written procedures. Block valves should have provisions to be either car-sealed or locked in an open position when not being used. For ASME Section VIII, Div. 1 pressure vessels, see UG-~~135~~156, Appendix M, and Jurisdictional rules for more information.