



**APPLICANT'S GUIDE FOR IMPLEMENTATION  
DEMONSTRATIONS OF QUALITY CONTROL  
SYSTEMS  
FOR THE REPAIR AND TESTING OF PRESSURE  
RELIEF VALVES UNDER THE "VR" AND "T/O"  
PROGRAMS**

NB-514 *Accreditation of "VR" Repair Organizations* and NB-528 *Accreditation of "T/O" Test Only Organizations* require a review of an applicant's quality control system by a National Board representative who will submit a recommendation regarding the issuance or renewal of a National Board "VR" and/or "T/O" certificate(s) of authorization. This review includes a demonstration of the system's implementation, consistent with the scope of work specified in the written description of their system.

To ensure uniformity of reviews, each applicant for a new or renewed National Board "VR" and/or "T/O" certificate(s) of authorization is responsible to carefully review the following criteria and be prepared to demonstrate the implementation of their quality control system during the National Board review.

**A. VALVES FOR VERIFICATION TESTING (VR and T/O)**

1. When the scope of work includes repair or testing of Section I valves, at least one demonstration valve shall bear the ASME "V" Code symbol stamp or ASME Certification Mark with "V" designator, have a flanged inlet and shall be of a size and set pressure sufficient to demonstrate the upper limits of the test equipment but within the capabilities of an ASME/National Board Accepted Testing Laboratory. A threaded valve may be used *provided it can be demonstrated that the repair of threaded Section I valves is representative of your scope of work.*
2. Section VIII air/gas and steam valves shall be of adjustable blowdown design unless the applicant limits their scope of work to repair of fixed blowdown valves only. Pilot valves are also acceptable. All valves must bear the ASME "UV" Symbol Stamp or ASME Certification Mark with "UV" designator. These valves shall be of a size and set pressure which represent the valves normally repaired and within the capabilities of an ASME/National Board Accepted Testing Laboratory.
3. For "VR" only the applicant shall be prepared to change the set pressure of at least one pressure relief valve to demonstrate the capability of selecting the proper spring, calculating a new capacity and proper stamping of the original and repair nameplates. (Re-stamping of the original nameplate may be omitted if the valve will be returned to its owner.)
4. For applicants who apply for "VR" and "T/O" concurrently and the "T/O" scope matches the "VR" scope no additional valves will need to be submitted for the "T/O" implementation demonstration beyond those

being submitted for the “VR” demonstration.

5. Valves that have been previously submitted and passed shall not be submitted again unless the applicant can produce a documented in-service record from their customer for the valve or if the valve has not been submitted in the past ten years.
6. **To ensure valves for verification testing are within the capabilities of the selected ASME/National Board Accepted Testing Laboratory**, we request that you contact the laboratory directly. A list of the laboratories is available on the National Board web page at the following address:

<http://www.nationalboard.org/Index.aspx?pageID=142&ID=63>

**B. SPECIAL PROCESSES (VR ONLY)**

The following criteria apply when that special process is included in the scope of work section of the written description of the quality control system.

1. **MACHINING**

The capability to reestablish critical dimensions by machining shall be demonstrated. Such demonstration shall include verification of critical dimensions after machining of an internal part of a pressure relief valve.

As an alternative, a pressure relief valve critical part may be fabricated in accordance with manufacturer's specifications, provided a system to control material specifications, drawings, tolerances, surface finishes, heat treatment etc. is established.

The written description of an applicant's quality control system shall clearly identify in the scope of work the degree of machining intended and shall include the necessary controls.

2. **WELDING**

The applicant shall have qualified, prior to the shop review, welding procedure specification(s), welder(s), and/or welding operator(s) in accordance with the ASME B&PV Code, Section IX. WPS(s) and supporting PQR(s), WPQ(s), with associated control documentation (e.g., welder's log and welding equipment calibrations) shall be presented to the National Board representative for review. A welding demonstration may be required.

3. **NON-DESTRUCTIVE EXAMINATION**

The capability of performing NDE shall be demonstrated by the applicant. This demonstration shall include, as a minimum,

. presentation of the qualifications of NDE personnel including the Level III, (or)

indication of the approved subcontractor who will perform NDE. The subcontractor's Level III qualification records shall be available.

Records shall be available for all personnel performing NDE as required by the ASME Code or manufacturer's specifications. These records shall support that personnel have been qualified to the applicant's or subcontractor's written practice which has been prepared using the American Society for Non-Destructive Tester's publication SNT-TC-1A latest Code accepted editions as a guide. Technique procedures used shall be prepared in accordance with ASME Section V and available for review by the National Board representative.

4. **HEAT TREATMENT**

Previous to the shop review, the applicant shall prepare procedures controlling heat treatment and/or postweld heat treatment. These procedures shall address the:

1. type of equipment used,
2. time and temperatures for base materials and thicknesses to be heat treated,
3. calibration of equipment and methods of assuring uniform and minimum temperatures are maintained,
4. documentation and control of material identification

C. **CONVERSIONS (VR ONLY)**

If conversions are included in the scope of work, the applicant shall be prepared to demonstrate conversion procedures by using these procedures to convert a valve. The conversions shall be representative of the type of conversions to be performed and included in the valves to be submitted for verification testing. The written description of the Quality Control system shall clearly describe the type of conversions to be performed. The system shall also address the following areas.

1. Provisions and responsibility for obtaining the latest applicable drawings, specifications and instructions for conversions to be performed.
2. Provisions for documenting on the repair traveler or checklist the conversion performed, including parts reworked or replaced, model number originally on the valve, and the new type or model number applied to the repair nameplate.

D. **QUALIFICATION OF TEST EQUIPMENT (VR and T/O)**

Documents used to satisfy the requirements of NBIC Part 4, par 4.6.1 b)2) must be collected and presented for every performance test system used to test pressure relief valves. This includes both shop test vessels as well as systems used in mobile repair facilities. Test vessels which have more than one test

nozzle or use more than one test fluid shall have each nozzle connection and fluid qualified as a separate system.

1. The schematic of the equipment as required by 4.6.1 b)2)a) should be of sufficient detail to describe and illustrate;
  - a) Test pressure vessel with attachment nozzles
  - b) Pressure relief valve sizes and pressures to be tested
  - c) Pressure source control valves
  - d) Isolation valves between the pressure vessel and pressure relief valve under test
  - e) Placement of pressure measuring equipment with sensing line inside diameter, length and arrangement
2. Items 4.6.1 b)2)b) through e) may be documented separately or may be described on the system schematic.
3. The portion of the documented package required by 4.6.1 b)2)f), method of qualifying, shall include a copy of the test result records (e.g. shop travelers, repair reports, accepted test laboratory results) used to support the qualification and a certifying statement by the certificate holder noting and accepting the adequacy of the comparison.

**E. QUALIFICATION OF LIFT ASSIST EQUIPMENT (VR and T/O)**

Documents used to satisfy the requirements of NBIC Part 4, par 4.6.3 c) must be collected and presented for each lift assist device being used to test pressure relief valves.

1. At least one lift assist device shall be available for demonstration during the review.

The National Board representative will determine acceptability of each demonstration during the review relative to the requirements of the applicable standard and the scope of work requested by the applicant. Should questions arise regarding these criteria, contact the National Board of Boiler and Pressure Vessel Inspectors Pressure Relief Department.

Rev. 9: Updated to include T/O implementation, add lift assist devices, verified to 2019 NBIC.