



The Technical Standards and Safety Authority
Boilers and Pressure Vessels Safety Program
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***GUIDE FOR MANUFACTURERS, FABRICATORS, INSTALLERS, REPAIRERS,
ALTERERS AND AUDIT TEAMS***

FOR THE

CERTIFICATION OF PRESSURE RELIEF VALVE REPAIR ORGANIZATIONS

IN ACCORDANCE WITH:

- **CSA B51 – Boiler, pressure vessel and pressure piping code**
- **NBIC NB-23 Part 4 – Pressure Relief Devices**

INTRODUCTION

This guide is prepared for the use of audit team leaders, members and applicants for TSSA Certificates of Authorization (C of A). It is not intended to replace or interpret the requirements of the CSA, NBIC, or the ASME Boiler and Pressure Vessel Codes. This guide does not list all the detailed requirements of the CSA, NBIC and ASME Codes referenced, but rather lists the highlights that the applicant is required to include in the written Quality Control (QC) Manual.

In addition, to assist the TSSA audit team, this guide is provided to applicants for their use in identifying and verifying the paragraph(s) where their QC Manual addresses all applicable control requirements of the CSA, NBIC and ASME Codes. The QC Manual must contain the description of the controls necessary for implementing the QC Program, but it is not required to contain all the programmatic requirements which will be found in the QC Program, such as written procedures.

The guide is based upon CSA B51, ASME, and NBIC NB-23 Part 4 requirements. The guide is subject to revision by TSSA based on changes made to the CSA, ASME, and NBIC Codes, from time to time, or based on feedback received from users.

An audit must cover a QC Manual and its implementation. It is recognized that the scope of work, QC Manual and Manual implementation will vary from one applicant to another, therefore, only those activities to be performed under the scope of an applicant's TSSA Certificate of Authorization are required to be addressed in the QC Manual. TSSA audit teams are advised that this guide may not outline all possible aspects of each audit. The QC Manual need not follow the format of this guide but shall described applicable requirements.

Questions of possible need for interpretation raised by the audit team members or the applicant shall be submitted to the TSSA Boiler and Pressure Vessel Chief Inspector for a resolution.

DEMONSTRATION OF THE QUALITY SYSTEM

Refer to the *Implementation Guideline for Companies requesting a TSSA Certificate of Authorization for Pressure Relief Valve Repair* for demonstration requirements.

HOW TO USE THIS GUIDE

Review each item in the checklist against the QC Manual and:

- 1) Check the applicable column, "Yes", "No" or "N/A" (Not Applicable)
- 2) Note the paragraph number in the QC Program Manual which covers the subject addressed in the column labelled "Quality Program Reference".
- 3) Submit one copy of the completed checklist with one uncontrolled copy of the current QC Manual to TSSA Head Office for review, at least one month prior to the scheduled implementation audit date.



QUALITY CONTROL SYSTEM CHECKLIST PRESSURE RELIEF VALVE REPAIR

Company Name: _____

Reviewed by: _____ Date: _____

No.	Quality Element and Sub-Elements	Yes	No	N/A	Quality Program Reference
1	GENERAL QUALITY CONTROL SYSTEM REQUIREMENTS				
	(a) The QCS is documented in detail in a QC Manual that addresses all requirements of the applicable Code Section and includes: (i) a cover sheet that contains the company name, physical address, and a brief description of the program scope(s) as it will appear on the requested Certificate(s) of Authorization. <small>(NOTE: The cover sheet may also contain the effective date of the QC Manual, mailing address, phone number or other information desired by the certificate holder or applicant.)</small>				
	(ii) a brief description of the work being accomplished under the Code or work the company wishes to accomplish under the code, including applicability of the QCS to shop activities, field activities, or both.				
	(iii) Indicate the type of valve repairs, including the range of sizes and pressures, as well as the testing medium to be used (steam, air/gas or liquid).				
	(iv) Indicate the special processes to be used, such as machining and non-destructive examination. <small>(NOTE: Welding and post weld heat treatment is not permitted.)</small>				
	(v) a Table of Contents page which includes each section by subject, number and revision number (as applicable).				
2	STATEMENT OF AUTHORITY AND RESPONSIBILITY				
	(a) The Statement of Authority and Responsibility shall include the following: (i) A statement that all work carried out by the applicant meets all applicable Code and Jurisdictional requirements, including a statement indicating that the attachment of the repair nameplate shall be applied only after the valve has been disassembled, inspected, and repaired by the company, and that the valve condition and performance are equivalent to the standards for new valves.				
	(ii) The authority and responsibility of those in charge of the QCS are clearly established and documented.				
	(iii) Persons performing QC functions have sufficient and well-defined responsibility, the authority and the organizational freedom to identify QC problems and to initiate, recommend, and provide solutions, including stop work orders if further processing would result in a non-conformance with the applicable Code section.				
	(iv) A statement that all disagreements in the implementation of the QCS is referred for resolution to a higher authority in the company.				
	(v) The Statement of Authority and Responsibility is signed and dated by a senior company official responsible for Code activities (i.e. President, Vice President, Plant Manager, etc.)				
3	MANUAL CONTROL				
	(a) Manual revision control system (i.e. is the QC Manual revised by page or by section, are the controls clearly described?)				
	(b) The title of the individual responsible for preparing and revising the QC Manual.				
	(c) The title of the individual responsible for reviewing current TSSA Code Adoption Document, new ASME, NBIC and CSA Code Editions and making any required changes to the QC Manual within six months from the new Edition issue date.				
	(d) Provision for review and approval of the QC Manual to maintain it is current.				



QUALITY CONTROL SYSTEM CHECKLIST PRESSURE RELIEF VALVE REPAIR

No.	Quality Element and Sub-Elements	Yes	No	N/A	Quality Program Reference
	(e) Provision for submittal of the QC Manual revisions to the TSSA Representative for acceptance prior to implementation including timely update of all copies to reflect approved revisions.				
	(f) In the case where the QC Manual exists in more than one language, at least one version is in English and identified as the authoritative version. In the case where the QC Manual exists in languages other than English, a statement by the C of A holder that the translation is correct shall be provided. (NOTE: A glossary of terms is desirable from the standpoint of clarity and if abbreviated titles of personnel and control documents are used throughout the QC Manual.)				
	(g) Provision for distribution of the revised QC Manual (controlled or uncontrolled), including hard copy and/or electronic controls.				
4	ORGANIZATION				
	(a) An organization chart showing the relationship between management, purchasing, shop repair, field repair, inspection, and quality control (as applicable) exists and reflects the actual organization. (NOTE: The purpose of this chart is to identify and associate the various organizational groups with the particular function for which they are responsible. The Code does not intend to encroach on the right to establish or alter whatever form of organization considered to be appropriate for Code work.)				
5	DRAWINGS, DESIGN CALCULATIONS AND SPECIFICATION CONTROL				
	(a) The title of the individual responsible to ensure controls exist for the maintenance of up-to-date drawings, specifications from the original valve manufacturer for valve repair, inspection and testing.				
	(b) The title of the individual responsible for maintaining the following Codes and specifications: <ul style="list-style-type: none"> • ASME Boiler and Pressure Vessel Codes (as applicable) • NB-18 Pressure Relief Valve Certifications • NB-23 Part 4 Pressure Relief Devices • ASME/ANSI B16.5 (as applicable) • API RP-527 				
	(c) The title of the individual responsible for the preparation and approval of internal company controls, procedures, and specifications used for valve repair, inspection and testing.				
6	MATERIAL CONTROL				
	(a) Describe the control and the title of the individual responsible for purchasing, receiving, storage and issuance of valve parts.				
	(b) A statement attesting that only original valve manufacturer's parts shall be purchased in the repair of valves.				
	(c) Controls exist to ensure the purchase order includes the information required by the OEM for all replacement parts, including springs.				
	(d) The title of the individual responsible for performing the receiving inspection of the parts to ensure conformance to the purchase order.				
	(e) The title of the individual responsible for ensuring customer supplied parts are accepted and certified by the certificate holder.				
	(f) Controls exist to ensure all parts are identified, and how the identity is maintained in the QC System.				
	(g) Controls exist for the handling of materials that are found to be non-conforming at receiving inspection.				
7	REPAIR AND INSPECTION PROGRAM				
	(a) Provisions are established for the use of checklists, process sheets, travelers, etc., which outlines the repair requirements and inspection procedures.				
	(b) The title of the individual responsible for selecting the appropriate materials and non-destructive examination method.				



QUALITY CONTROL SYSTEM CHECKLIST PRESSURE RELIEF VALVE REPAIR

No.	Quality Element and Sub-Elements	Yes	No	N/A	Quality Program Reference
	(c) Describe the process and the title of the individual responsible for issuing a unique identifier traceable to the repaired valve nameplate. The unique identifier shall be listed on the checklist/traveler and shall describe the original nameplate information and specify the ASME Code stamping.				
	(d) Measures have been established to ensure the following information is included on the checklist/traveler: <ul style="list-style-type: none"> • Visual inspection including complete nameplate data • Disassembly • Cleaning • Inspections, including valve trim • Machining • Lapping • Re-assembly • Adjusting rings • Testing • Sealing • Repair nameplate 				
	(e) Provisions exist to ensure there are signoffs at each operation to verify that each operation has been properly performed.				
	(f) The title of the individual responsible for reviewing and accepting the checklist/traveler, and ensuring it is accurate and complete.				
	(g) Provisions exist to ensure there is a method of controlling the repair or replacement of critical valve parts, as well, the method of identifying each spring shall be indicated.				
	(h) The title of the individual responsible for the set pressure change of valves and how it is accomplished.				
	(i) The title of the individual responsible for ensuring that all personnel engaged in the repair of the valve are trained and qualified in accordance with the requirements of the QC Manual and the NBIC (Part 4, Section 4.9).				
	(j) Measures are established to control field activities, when applicable.				
8	NON-CONFORMANCES				
	(NOTE: A non-conformance is any condition which does not comply with the applicable rules of the Code, QC Manual, or other specified requirements. Non-conformances must be corrected before the completed item can be considered acceptable to Code.)				
	(a) Controls exist for the correction of non-conformances. The controls shall include:				
	(i) The title of the individual responsible for reviewing the non-conforming condition.				
	(ii) Identifying and controlling further processing of non-conforming items until final disposition.				
	(iii) Documenting the non-conformance and the disposition.				
	(iv) Addressing the non-conformance on the checklist.				
	(v) The title of the individual responsible for the final inspection and disposition.				
9	NON-DESTRUCTIVE EXAMINATION				
	(a) Provisions exist to ensure there is a method of controlling dimensions, including seat finish of critical parts where a deviation from the manufacturer's critical dimension chart could affect the valve flow passage, capacity function or pressure retaining integrity.				
	(b) When NDE is required and performed, the written procedure shall meet the requirements of ASME Section V and NDE personnel shall be certified in accordance with CGSB standards.				



QUALITY CONTROL SYSTEM CHECKLIST PRESSURE RELIEF VALVE REPAIR

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	(c) The title of the individual responsible for maintaining NDE Reports and personnel certification records.				
10	VALVE TESTING, SETTING AND SEALING CONTROL				
	(a) Measures are established to ensure that:				
	(i) Each valve is tested, set, and sealed in accordance with the required ASME Code. Valves marked for steam service shall be tested on steam. Valves marked for air, gas, or vapor service shall be tested with air or gas. Valves marked for liquid service shall be tested with water or another suitable liquid. Section IV hot water valves shall be tested on water, steam or air.				
	(ii) When ASME Section VIII valves are repaired by the owner for the owner's own use, valves for steam service may be tested on air for set pressure and when possible, blowdown adjustment, provided the manufacturer's corrections for differential in set pressure between steam and air are applied to the set pressure.				
	(iii) Testing equipment shall include a pressure vessel of adequate size, volume and capacity to cause the disc to lift significantly (pop open) and re-close. The equipment used for performance testing shall be certified and meet the requirements of NBIC Part 4, Section 4.6.1.				
	(iv) Prior to use, all performance testing equipment shall be qualified by the certificate holder to ensure 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 or comparisons to field performance. This qualification shall be documented, and provisions made to retain such documentation for a period of at least five years after the testing equipment is retired. Documentation of this qualification shall include, but not be limited to: <ul style="list-style-type: none"> • Schematic of the performance test equipment • Size and pressure ranges of valves to be tested. • Dimensions of test vessels • Accuracy of pressure measuring equipment • Size and design type of valves used to control flow • Method of qualifying 				
	(v) Prior to the implementation of any addition or modification to the testing equipment which would alter the contents of the document required in NBIC Part 4, Section 4.6.1(b)(2), the certificate holder shall re-qualify the performance test equipment. If the equipment changed was used to satisfy the requirements of verification testing, the certificate holder shall notify TSSA and additional verification testing may be required.				
	(vi) The system shall include a method of controlling the setting (and blowdown where applicable) for each valve to ensure tolerances are within the requirements of the ASME Code.				
	(vii) Adjustments are made in accordance with the valve manufacturer's recommendations to ensure proper lift and blowdown (when applicable).				
	(viii) Cold differential set pressure has been performed in accordance with the valve manufacturer's recommendations.				
	(ix) The procedure for seat tightness specifies the following: <ul style="list-style-type: none"> • Test apparatus • Test medium • Test pressure • Leakage test • Acceptance criteria (leakage rate) 				



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No.	Quality Element and Sub-Elements	Yes	No	N/A	Quality Program Reference
	(x) Provisions are made to ensure all external adjustments are sealed, and the identification make of the repair organization (where applicable). The seal shall identify the certificate holder making the repair. Abbreviations or initials shall be permitted, provided such identification is acceptable to TSSA.				
	(xi) All test data and signoffs are recorded on the checklist/traveler.				
11	LIFT ASSIST TESTING CONTROL				
	(a) When lift assist devices are used for testing, the following shall be addressed:				
	(i) Describe when lift assist device testing will be used in lieu of the tests required in NBIC Part 4, Section 4.6.1.				
	(ii) Describe the device(s) to be used for lift assist testing.				
	(iii) When actual blowdown and valve performance characteristics cannot be verified, the valve set pressure may be determined to an acceptable degree of accuracy with a lift assist device, provided: <ul style="list-style-type: none"> • Equipment utilized is calibrated • The device and test procedures proven to give accurate results are followed • Static inlet pressure is applied with the test medium specified in NBIC Part 4, Section 4.5.1 • Adjustments are made in accordance with the valve manufacturers recommendations to ensure proper lift and blowdown 				
	(iv) Is the lift assist device qualified per NBIC Part 4 Section 4.6.3c) & documented				
12	VALVE REPAIR NAMEPLATE CONTROL				
	(a) For valve repair nameplates, measures have been taken to ensure:				
	(i) An effective method for valve nameplate stampings is established to ensure proper stamping of each valve as required by NBIC Part 4, Section 4.7.1. The manual shall include a description of the nameplate or a drawing.				
	(ii) The repair nameplate shall contain the data as required by NBIC Part 4, Figure 4.7.2(a), and shall include the TSSA QA Number. Changes to the original PRV nameplate information shall meet the requirements of NBIC Part 4, Section 4.7.3. The following shall be described: <ul style="list-style-type: none"> • Attachment of the nameplate • Illegible original valve manufacturer/assembler nameplate • Original valve manufacturer nameplate is missing 				
	(iii) The title of the individual responsible for verifying the nameplate data and signing off on the checklist/traveler.				
	(iv) An exhibit of the nameplate shall be included in the QC Manual.				
13	FIELD REPAIR CONTROL				
	(a) Measures are established to ensure:				
	(i) The scope of field repairs is addressed.				
	(ii) The title of the individual responsible for the field repair, supervision, verifying the checklist/traveler and maintain all field repair records.				
	(iii) Any mobile repair facilities and testing capabilities are described.				
	(iv) The title of the individual responsible for issuing repair documentation which should include: <ul style="list-style-type: none"> • OEM repair manual and instructions • Repair checklist/traveler 				



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No.	Quality Element and Sub-Elements	Yes	No	N/A	Quality Program Reference
	<ul style="list-style-type: none"> • Applicable ASME Code (PRV installation) • Repair organization written procedures and instructions • QC Manual for field use • Auxiliary lift device written procedures and instructions • Pressure gauges and records 				
	(v) The title of the individual responsible for performing field audits, which shall include, but not be limited to performance testing in accordance with the NBIC. All audits to be documented.				
	(vi) All functions affecting the quality of the repaired valves to be supervised from the address of record on the issued certificate.				
14	CALIBRATION OF MEASURING AND TEST EQUIPMENT				
	(a) Controls exists for the calibration of examination, measuring, and test equipment used in fulfillment of applicable Code requirements.				
	(b) Measures are established to ensure that:				
	(i) Calibration records are maintained and that status indicators are used to indicate the current calibration status of the equipment.				
	(ii) Calibration equipment is maintained in good condition, checked for signs of damage, and removed from service if found defective.				
	(iii) A calibration frequency is established and maintained, and results are traceable to National Standards.				
	(iv) When calibrations are performed in-house, the title of the individual responsible is identified and procedures are established.				
15	RECORDS RETENTION				
	(a) The title of the individual responsible for retaining records for a period of at least 5 years.				
	(b) The manufacturer or assembler shall maintain the documents outlined below for a period as required by the Code of Construction:				
	(i) Report of Repair				
	(ii) Original Manufacturer's Data Reports				
	(iii) Manufacturer's drawings				
	(iv) Checklists, process sheets, travelers, etc.,				
	(v) Non-Destructive Examination reports				
	(vi) Repair procedures and records				
	(vii) Non-conformances and dispositions				
	(viii) Pressure test records				
	(ix) Copy or photograph of nameplate(s)				
	(x) Any other applicable documentation				
16	TRAINING AND QUALIFICATION OF PERSONNEL				
	(a) The title of the individual responsible to ensure that personnel engaged in repairs of the PRV are knowledgeable and qualified within the scope of the repairs to be conducted.				
	(b) The repair organization shall establish a documented in-house training program, and as a minimum, shall consist of the following:				
	• Applicable ASME Codes and the requirements of the QC Manual				
	• Responsibilities within the QC Manual				
	• Knowledge of the technical aspects and mechanical skills for the applicable position held				
	(c) A description of the method of evaluating the training effectiveness.				
	(d) A description of minimum qualification requirements for personnel engaged in valve repair.				
	(e) A description of the documented evaluation and certification of an individuals' qualification for the applicable position held.				
	(f) The title of the individual responsible for performing the annual review of qualifications of repair personnel to verify proficiency, as well as				



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No.	Quality Element and Sub-Elements	Yes	No	N/A	Quality Program Reference
	compliance with the certificate holder's quality system, including audits at field sites. The review shall be documented and shall address: <ul style="list-style-type: none"> • Training records • Documented evidence of work performed • Monitoring job performance 				
	(g) The title of the individual responsible for maintaining training and personnel qualification records.				
17	SAMPLE FORMS				
	(a) Forms used to control functions relative to quality are included within the QC Manual and their use explained in the text of the QC Manual.				