

## **Guide for the preparation of quality programs for licensing of companies performing BPE regulated work.**

Company Name: \_\_\_\_\_  
QC Program issue#: \_\_\_\_\_  
Revision# \_\_\_\_\_

### **Overview:**

1. This guideline highlights program elements of a quality system that addresses the minimum requirements to enable licensing of companies performing regulated work.
2. Based on the scope of work the company performs, not all program elements are required but all must be addressed.
3. Quality manuals should reflect the actual work processes used by the company.
4. The completed manual and this guide must be submitted for review to the BPE Inspector.

# Guide for Quality Control Program Requirements

## 1. INTRODUCTION

This guide is intended to assist companies in developing a Quality Control (QC) Program for performing regulated work within the Province of Nova Scotia to ensure Boiler and Pressure Equipment (BPE) is constructed, repaired and altered in accordance with the Technical Safety Act and Regulations of Nova Scotia.

This guide is to be used by the Company to indicate in the Reference column where the elements are to be found in their QC Manual.

## 2. GLOSSARY OF TERMS

ASME - American Society of Mechanical Engineers

ASME A1.20-3/05 - Guide for ASME Review Teams for Review of Applicants for ASME Certificates of Authorization

BPE - Boiler and Pressure Equipment

NBIC - National Board Inspection Code

NB-57 - National Board ASME Guide

CSA - Canadian Standards Association

QC - Quality Control

Inspector - a BPE Inspector

MAWP - Maximum Allowable Working Pressure

MDMT - Minimum Design Metal Temperature

NDE - Non Destructive Testing

CRN - Canadian Registration Number

WPS / BPS - Welding / Brazing Procedure Specifications

## 3. REFERENCE CODES AND STANDARDS

- ASME Section I
- ASME Section IV
- ASME Section VIII Div. I
- ASME Section IX
- ASME B31.1
- ASME B31.3
- CSA B51
- CSA B52
- NBIC (National Board Inspection Code)

## 4. GENERAL REQUIREMENTS

The QC Program should be described in a Quality Control (QC) Manual. The QC Manual must cover all of the requirements set out in the Act and Regulations for the work to be performed. The QC Program elements listed below are intended as guidelines to assist in the preparation of a QC Manual. It is recognized that some of the elements listed may not apply, but all applicable elements must be included in the QC Manual.

# Guide for Quality Control Program Requirements

## 5. QC MANUAL ELEMENTS

Paragraph

### 5.1 Title Page

1. Company name and address
2. A listing of the applicable Code sections and standards work is being performed to.
3. Applicability of the QC Program to shop and/or field work.
4. The manual revision level and date and whether the manual is controlled or uncontrolled.

### 5.2 Scope

The QC Manual shall clearly indicate the scope and type of regulated work the organization is capable of and intends to carry out, and whether or not the activities will be conducted in a shop, field site, or both.

### 5.3 Table of Contents

A list of the QC Manual sections with titles.

### 5.4 Glossary of Terms

All abbreviated titles used in QC Manual must be defined.

### 5.5 Statement of Authority

1. Statement referencing the code section (s) and standards which the QC Program is intended to comply.
2. State the authority and responsibility of those persons accountable for controlling and implementing the QC Program.
3. Establish the individual's freedom within the organization to identify quality problems, initiate, recommend and provide solutions.
4. Must contain a statement indicating the full support of management for the QC Program.
5. Must provide measures to ensure code / regulation requirements are not negated when conflicts are resolved by the senior company official.
6. Statement must be signed and dated by a senior company official responsible for regulated work.

### 5.6 Organization Chart

1. Must contain the job titles of key personnel used throughout the QC Program to designate responsibilities within the organization. The job titles shown in the organization chart must be consistent within the QC Program however personnel in smaller companies can hold multiple titles.
2. Must show the relationship between key personnel to reflect the current structure of the company.
3. The personnel assigned the responsibility for the QC Program must have sufficient authority within the organization to effect change.

### 5.7 Manual Control

1. Preparation, revision, distribution and implementation of the QC Manual must be assigned.
2. Describe how the QC Manual will be revised, when revisions will be completed, and how the revisions will be identified within the manual.
3. Ensure that all proposed revisions to the QC Manual are presented to the Inspector prior to inclusion and implementation.

# Guide for Quality Control Program Requirements

4. Ensure a current controlled copy of the QC Manual is available for use by the Inspector at all locations where work is being performed.

Paragraph

## 5.8 Material Control

1. Indicate who is responsible for ordering materials, and who establishes the material requirements for code compliance.
2. If substitution of materials is allowed, indicate by whose authority; and if the Inspector is involved.
3. Describe how purchase orders are completed, with all the information required by the Material Specification and the applicable code section, a request for MTR's when required by code, the applicable ASME or ASTM specifications and cross reference to the work being completed.
4. Indicate who reviews and approves purchase orders prior to use and their distribution once they have been approved.
5. Specify who is responsible for receiving materials.
6. Describe how materials and parts are inspected upon receipt.
7. Detail the source of information used to verify that materials are correct.
8. Indicate how non conforming materials are handled.
9. Describe how acceptable materials are identified and material traceability maintained.
10. Specify who reviews MTR's and COC's for compliance with ASME Sec. II when required, how they are traceable to the work being completed and where they are stored.
11. Specify who ensures standard pressure parts are verified for code compliance and registration with the Jurisdictional Authority, when required.
12. Describe how materials are stored and issued for fabrication.
13. Describe the system of identification used prior to cutting materials into two pieces or more. A colour code or coded marking system may be used.
14. Describe how traceability is not lost if heat treatment is required.

## 5.9 Drawing, Design, Calculation, Specification Control

1. Specify who prepares and approves design calculations and drawings.
2. Assign responsibility for review of customer's supplied calculations, specifications and drawings to ensure code compliance and/or registration.
3. Describe how revisions are issued and retrieved and how superseded drawings are disposed of.
4. Describe measures to ensure all documents are the latest revision.
5. Indicate who approves drawings for fabrication.
6. List any additional information to be identified on the approved drawings, such as:
  - i. Code Edition and Addenda
  - ii. MAWP
  - iii. MDMT
  - iv. NDE required
  - v. WPS / BPS
  - vi. CRN
6. Describe how Purchase orders, job numbers and documents are cross referenced.
7. Indicate who ensures that all designs, drawings and specifications are submitted to the Jurisdictional Authority, when required.
8. Statement to ensure that no fabrication will commence unless design registration is complete or prior approval is received from the Inspector.

# Guide for Quality Control Program Requirements

## 5.10 Examination and Inspection

Fabrication operations, including examinations and testing procedures must be described in sufficient detail to permit the Inspector to determine at what stages specific inspections are to be performed.

1. Specify who is responsible developing the inspection and test plan (ITP) for fabrication. The ITP should include all the essential sign off points and examinations for the scope of work to be performed.
2. Specify who ensures the ITP and any applicable information provided to the Inspector, prior to work being performed, to review and assign any hold points.
3. The ITP should indicate all welding / brazing procedure specification(s), NDE and heat treatment procedures and any other controls provided for these functions.
4. Specify who is responsible to ensure that the ITP points are marked off as they are complete and the controls in place to ensure that the Inspector is notified in advance of all assigned hold points.
5. Specify who is responsible for filling out and signing the Data Report and ensuring it is correct prior to presenting it to the Inspector for signature.
6. Specify who verifies the accuracy of the nameplate data, if applicable, prior to stamping and installation.
7. Describe the process for defining, identifying, controlling, and implementing Repairs of a Routine Nature.

## 5.11 Welding / Brazing Control

All welding / brazing must conform to the requirements of ASME Sec IX and other sections of the Code as applicable to the scope of work being performed.

### *WPS / BPS AND PQR*

1. Specify who is responsible for the development and certification of Procedure Qualification Records (PQR) and Weld Procedure Specifications (WPS) or Brazing Procedure Specifications (BPS) and who certifies the PQR for the company.
2. Describe how revisions to WPS / BPS's are controlled and when changes to essential, nonessential and supplementary essential variables are required, how they are identified, dated and controlled.
3. Describe how WPS / BPS's are assigned for regulated work, including tack welding and if copies of the WPS / BPS made available to the welders in the work area. Describe how the welder receives directions, or instructions in accordance with the WPS / BPS.
4. Specify who is responsible for ensuring that the WPS / BPS is registered with the Jurisdiction before being released for use for regulated work.

### *GENERAL WELDING / BRAZING REQUIREMENTS*

1. Specify who is responsible for instructing, supervising, and assigning welders for regulated work and how are they assigned
2. Indicate how tack welds are treated. Are they removed before completing the final weld or are they prepared and incorporated into the weld and what controls are in place to ensure they were completed by a qualified welder and WPS / BPS?
3. Describe how welding / brazing materials are ordered, received and stored prior to use and who is responsible to ensure welding / brazing materials have been ordered with the correct SFA and AWS designation.

Paragraph

# Guide for Quality Control Program Requirements

4. Specify who is responsible for the issue and return of welding / brazing materials and how welding / brazing materials are issued and how long welding / brazing materials can remain out of heated storage before they require heat treatment or must be discarded.
5. Specify the requirements for heated storage of coated electrodes after removal from the sealed Containers, and if they are they stored in accordance with the manufactures recommendations, or Part C of ASME Sec II.
6. Describe how production welds are identified, the requirements for stamping or weld mapping and who is responsible to ensure weld identification.

Paragraph

## **WELDER / BRAZER QUALIFICATION**

1. Specify who is responsible for verifying a welder / brazer's qualifications before use in regulated work and who maintains a list of qualifications for each welder and updates it to ensure 6 month continuity.
2. Specify who is responsible for conducting welder / brazer qualification tests.
3. List the procedure(s) being followed during the qualification testing.
4. It must be stated that all welder / brazer qualification tests will be performed in accordance with a registered WPS / BPS.
5. Describe how failed weld / brazer tests are handled and the requirements for the welder / brazer to be eligible to retest.
6. Document control and retention of the test coupon must be specified, including who is responsible to ensure the QW-484 form is filled out correctly and certified by the company representative.
7. Specify who is responsible to submit the test documentation to the Jurisdiction.

## **5.12 Nondestructive Examination (not applicable to CSA B52)**

It must be stated that all NDE conforms to the requirements of ASME Sec V and other sections of the Code as applicable to the scope of work being performed.

1. Specify who is responsible for determining if NDE is required and if NDE is performed in house or subcontracted or both.
2. State how the training of personnel, approval of procedures and reports are identified. The Level III Examiner may be an employee of the company or subcontracted. If they are subcontracted a letter of appointment by the company must be issued and a copy kept on file.
3. State that personnel performing NDE must be qualified and certified in accordance with CGSB and their qualifications maintained by their employer.
4. Specify who reviews and accepts the NDE interpretations to ensure code compliance. Ensure all NDE results, including film and interpretation sheets are available for review and acceptance by the Inspector.
5. Indicate that the Inspector has the right to require re-qualification of NDE personnel and procedures for cause.
6. State that all NDE procedures shall be demonstrated capable of producing meaningful results to the satisfaction of the Inspector, as required by ASME Sec V, Article 1, Paragraph T-150.

## **5.13 Heat Treatment (not applicable to CSA B52)**

1. Indicate who is responsible to determine if heat treatment is required and whether heat treatment is performed in house or subcontracted.

# Guide for Quality Control Program Requirements

2. Specify who prepares and approves written heat treatment procedures or instructions and if they satisfy the requirements of ASME Sec II and the WPS. State what measures are taken to ensure the proper placement of thermocouples.
3. For in house heat treatment, indicate who is responsible to monitor the activities performed to ensure compliance with the written procedures or instructions and who reviews and approves the heat treatment charts and ensures calibration of the equipment used.
4. For subcontracted heat treatment, state what measures are taken to assure proper performance and calibration, and that proper records of heat treatment are completed and who is responsible for the review and acceptance of the charts and calibration records of equipment used.
5. Describe how identification of parts is maintained when parts are sent to a subcontractor's facilities and who is responsible to ensure the correct parts are sent and received and checked for visible damage upon receipt.
6. State that test specimens or coupons are made where required by the code section.
7. All heat treatment results, including charts, procedures and instruction sheets are available for review and acceptance by the Inspector.

Paragraph

## 5.14 Calibration

1. Indicate who is responsible for calibration control.
2. Describe how calibrated equipment is identified and how are they traceable back to a calibration record.
3. List the equipment that is calibrated under this program and the frequency of calibration required for each type of equipment listed.
4. State that all master equipment used for calibration must be calibrated and traceable to a NIST Standard.
5. Describe the storage and handling of calibrated equipment.
6. Describe the measures to be taken when calibrated equipment is found to be out of calibration.

## 5.15 Correction of Nonconformities

A nonconformity is any condition which does not comply with the applicable rules of the Code, Standards, Act & Regulations or the QC Program. Nonconformities must be corrected before the completed component can be considered in compliance with Code.

1. Define a non conformity and who is responsible for the identification, disposition and resolution of nonconformities.
2. Describe the process for the correction of nonconformities, including Inspector involvement and who is responsible to ensure the Inspector is notified for concurrence.
3. Describe how nonconforming items are controlled until final disposition, and who is responsible to ensure the item has been corrected as per the disposition and all actions are cleared before release for fabrication.
4. If the nonconformity is a systemic problem, describe the controls in place to ensure the system is corrected to ensure compliance with the Code, Standards or Act & Regulations.

## 5.16 Records Retention

1. State who is responsible to ensure records used within this program are retrieved and stored and provide a list of the records to be retained and for how long.
2. State that the Inspector has access to the records listed.
3. Describe how Data Reports are issued and stored.

# Guide for Quality Control Program Requirements

## 5.17 Inspector Liaison

1. Assign responsibility for liaison with the Inspector
2. Provide free access for the Inspector to all shop and field locations where work is being performed.
3. Ensure that the Inspector is notified of all work in progress and approaching inspection points or assigned hold points.

## 5.18 Audits

This section is not required by Code, but is recommended to assist in the continual improvement of a quality program and assess its effectiveness. At a minimum it should identify the need for audits to be performed, who will conduct them, how often they will be completed and a feed back mechanism to inform those affected of any changes required

## 5.19 Routine Repairs

This section is not required by Code but is recommended to enhance the flexibility of the permit requirement process in the Contractors License. Routine repairs are common, basic repairs, installations or maintenance that is agreed upon during the manual review and implementation process. Once established with the reviewing BPE Inspector, repairs described in this section may be performed as pre authorized and not requiring the permit application. All records are subject to future audits and must be maintained as per the records retention process.

Example of routine repairs:

- Section of pipe replacement up to 4"OD
- Repair to piping up to 4"OD
- Fitting replacement. (Valves, elbows, tees, flanges...)
- Repair to boiler tubes maximum of 2 tubes.
- Replacement of a cast iron sections on a Boiler
- Replacement of tube bundle in Heat Exchanger

## 5.20 Sample Forms

1. Include copies of all company specific forms, tags; and stickers used in the QC Manual.
2. Reference must be provided to the website, code book or standard where Jurisdictional, Code or Standard forms are used within the QC Manual
3. Ensure that the titles of the documentation included match those used within the manual.
4. Internal procedures or instructions, WPS / BPS and PQR need not be included but may be referenced.
5. Describe the method of controlling revisions to forms used in the QC Program.

Paragraph