Quality Plan Requirements for an Alberta Certificate of Authorization Permit Holder Pressure Vessel Design Submission

AB-530

Edition 1, Revision 3 – Issued 2019-04-16

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FOREWORD

As provided in PESR Sections 12(1)(e) and 15(j), the Administrator in the pressure equipment discipline has established that ABSA Document AB-530, Quality Plan Requirements for an Alberta Certificate of Authorization Permit Holder Pressure Vessel Design Submission , defines specific features of the QP process that must be addressed in the quality management system of a pressure vessel manufacturer that chooses to develop and implement a QP process for piping design submissions.

This document establishes additional quality management system requirements and emphasizes the Quality Plan Requirements for existing quality management systems for pressure vessel manufacturers in Alberta holding a Certificate of Authorization Permit.

The scope of the activities to be undertaken shall be documented as part of the description of the Quality Plan Requirements. This will include the detailed description of the Recognized Design Submitter competencies. The Recognized Design Submitter is responsible for reviewing and ensuring that the Design Registration Application is in compliance with the Quality Plan Requirements and regulatory requirements prior to submitting it to ABSA for registration.

1.0 INTRODUCTION

This AB-530 document defines quality management system requirements that shall be addressed to achieve and maintain acceptance of a Quality Plan for a pressure vessel design submission as an added function within a quality management system established and maintained by the holder of an Alberta Certificate of Authorization Permit for the construction of pressure vessels.

The Quality Plan is an enhancement for a pressure equipment manufacturer quality management system. The enhancement includes the establishment of processes and competent personnel to perform a thorough review of a design submission prior to its being submitted to ABSA for registration. The goal of the Quality Plan is to improve the quality of design submissions in terms of deficiency-free design submissions that can be accepted by ABSA for registration without re-work by the submitting organization. A deficiency-free design submission is a design submission which considers and complies with code of construction and regulatory requirements. Design submission deficiencies result in delays in completing the registration process and decrease registration efficiency for the design submitting organization and for ABSA.

Participation of the Quality Plan is voluntary. A manufacturer that chooses to participate may find that the implementation of the program may result in additional technical-administrative work. The benefit will be reduced time to obtain a design registration from ABSA.

The information in this document is intended for Alberta-based manufacturers that hold a quality management system Certificate of Authorization Permit issued for the construction of pressure vessels in accordance with the PESR Section 11(1)(a). The process may be used by anyone that submits designs for registration, however formal recognition of the process is limited to Alberta-based manufacturers.

An Alberta-based manufacturer may apply to become a participant in the Quality Plan. The application and authorization process, as described in this document, is similar to the process used to initially obtain the Certificate of Authorization Permit. Once the Quality Plan has been recognized, the extent of the design submission review by ABSA will be determined on a risk-informed decision based on the submitting organization’s performance history and design type.

The information in this document and other referenced ABSA documents were developed, and are updated periodically, based on ongoing consultation with Alberta pressure equipment manufacturers, other stakeholders, codes, standards, and other published information. This process is designed to ensure that documents issued by ABSA, reflect current best industry practices that are suitable for all industry sectors.

ABSA policy documents are developed through close cooperation with pressure vessel manufacturers and other stakeholders; their input has been invaluable in compiling this document.

ABSA policy documents are living documents that are reviewed periodically to ensure that they are aligned with current industry practices. We would welcome any suggestions you have to improve this document. Please provide your comments to:

Po Fok
Design Survey Manager
fok@absa.ca

2.0 SCOPE

Part 1 of this document establishes requirements that must be addressed in a quality management system for pressure vessel manufacturers that choose to participate in the Quality Plan. The manufacturer is responsible to submit a written description of the quality management system to comply with the requirements of this document.

Part 2 of this document provides guidance and information for manufacturers that are developing the Quality Plan quality management system processes and procedures.

3.0 ELIGIBILITY

Alberta-based manufacturers that meet all of the following criteria are eligible to participate.

a) Holds a quality management system certification of authorization permit in accordance with Section 11(1)(a) to construct pressure vessels.
b) Develops, implements and maintains a quality management system that addresses the requirements of this document.
c) Makes an application to include the Quality Plan in the scope of their quality management system as described in this document, as a part of the manufacturers quality management system (Certificate of Authorization Permit) or as a separate document.
d) Employs a person that has been recognized by ABSA to perform the duties of a Recognized Design Submitter.

4.0 DEFINITIONS AND ACRONYMS

Refer to the Safety Codes Act and regulations for other relevant definitions.

Definitions for acronyms frequently used in this document:

ABSA – is the organization delegated by the Government of Alberta to administer the pressure equipment safety legislation under the Safety Codes Act.

Act and Regulations – means the Alberta Safety Codes Act and the following regulations:

- Pressure Equipment Exemption Order (Alberta Regulation 56/2006),
- Pressure Equipment Safety Regulation (Alberta Regulation 49/2006),
- Power Engineers Regulation (Alberta Regulation 85/2003),
- Pressure Welders Regulation (Alberta Regulation 169/2002).

Administrator – means the Administrator in the pressure equipment discipline appointed under the Act. [PESR 1(1)(b)]

Certificate of Authorization Permit (CAP) – means a permit issued pursuant to section 44 of the Act authorizing a person to carry out the activities stated on the certificate of authorization permit. [PESR 1(1)(g)]

Competent – in relation to a person, means possessing the appropriate qualifications, knowledge, skills and experience to perform the work safely and in accordance with the Act. [PESR 1(1)(i)]

DRA – means Design Registration Application. A Design Registration Application is a result of the DRA development planning, input, output, review, verification and validation process. The DRA is a collection of documents that addresses technical and administrative requirements to be submitted to ABSA for the purpose of design registration, as required by the Act and regulations.

Information Bulletins (IB) – are Information Bulletin documents issued by the Administrator that define requirements or expectations.

ISO – International Organization for Standardization

Manufacturer – means the company or person that manufactures, completely or in part the product (pressure equipment). The manufacturer completes the product and is responsible for the end product. [CSA B51 Clause 3]

PESR – means Pressure Equipment Safety Regulation, Alberta Regulation 49/2006

Pressure Equipment – means a boiler, a fired-heater pressure coil, a thermal liquid heating system and other equipment designed to contain expansible fluid under pressure, including, but not limited to, pressure vessels, pressure piping systems and fittings, as defined in the regulations. [SCA 1(1)(y)]

Quality management system (QMS) – means all the documented, planned and systematic actions needed to ensure that this Act is complied with. [SCA 1(1)(aa)]

QP – means Quality Plan Requirements

Recognized Design Submitter (RDS) – means Recognized Design Submitter, who is nominated by the organization and recognized by ABSA and has the responsibility of ensuring that the Design Registration Application and processes related to the Design Registration Application realization are adhered to for the purpose of the Quality Plan.

PART 1: REQUIREMENTS

5.0 QUALITY MANAGEMENT SYSTEM

The written description of the manufacturer's QMS is not described in this section, however shall include supplemental requirements of the AB-530, and be made available to ABSA for review, acceptance and audit. The written description of the QP may be:

(a) incorporated into the manufacturer's previously accepted QMS documentation.

Or

(b) a supplement that is referenced in and controlled under the previously accepted QMS.

5.1 Scope and Application

The scope of the QP for pressure vessels shall be limited to design submissions for pressure vessels designed under provisions of CSA B51 and ASME Sec. VIII Div.1.

The manufacturer is responsible for identifying, defining and describing of the type of pressure vessel designs to be included in the QP.

The written description of the QP scope shall:

(a) Define the quality objective of the manufacturer's QP that results in an acceptance of a deficiency-free DRA by ABSA without rework or revision.
(b) Provide an overview of the manufacturer's DRA realization plan.
(c) Provide a brief description and identification of activities.
(d) Define the types of vessel designs to be included in the QP. (Provide a description of the pressure vessels in terms of type, size, etc.)

5.2 Processes and Procedures

The manufacturer is responsible for identifying, defining, developing and documenting the required processes/procedures for deficiency-free DRA realization. The manufacturer shall structure the DRA realization process in a manner that fits the manufacturer's needs and business.

The written description of the QP shall include, as a minimum, the processes and procedures listed below:

(a) Regulatory and ABSA related processes. (Refer to Part 2: Guidance)
(b) Processes and procedures for a deficiency-free DRA.

(c) Personnel duties and responsibilities involved with the DRA realization. This shall include:
    1. Identifying personnel and resources.
    2. Identifying competency requirements for personnel to be certified RDS.
    3. Identifying competencies requirements for personnel involved with the DRA realization other than the RDS.
    4. Assessing the personnel training needs for continuous education.
    5. Identifying the process to verify competency.
    6. Identifying the competency certification process for the RDS.
(d) Identify the RDS nomination process.
(e) Internal audits of the QP will be performed as specified in the manufacturer's QMS to determine its effectiveness.

Note: The QP may be reviewed during an Alberta Quality Program Certificate of Authorization Permit renewal or surveillance audit.

5.3 Recognized Design Submitter (RDS)

The manufacturer shall identify, certify and nominate at least one person, to be known as the RDS, to be responsible for the entire DRA realization. This certification shall be documented by the manufacturer. The manufacturer shall nominate a person for the RDS role. The nomination shall be on Form AB-260 and submitted to ABSA Design Survey. The manufacturer shall document the duties and responsibilities of the RDS.

The RDS shall be a person who:

(a) Has met the manufacturer's competencies requirements for the purpose of the QP,
(b) Is certified competent by the manufacturer,
(c) Is nominated by the manufacturer for the RDS role,
(d) Is subsequently recognized by ABSA,
(e) Is designated the main contact person for the manufacturer in communication with ABSA relating to the DRA realization,
(f) Has overall responsibility for carrying out design and other DRA activities and monitoring performance of other personnel involved in the DRA realization, and
(g) Is responsible for the completeness and correctness of the DRA.

6.0 APPLICATION AND RECOGNITION PROCESS

A manufacturer that elects to participate in the QP shall revise its QMS to address the requirements specified in the AB-530 document and shall apply to ABSA for acceptance of the QMS revisions. The application shall include:

(a) Form AB-31 Design Registration Application,
(b) Letter request to participate in the QP,
(c) The application shall include the manufacturer's certification that the nominee is competent to perform duties in accordance with 5.3(b).
(d) A controlled copy of the written description of the QMS, and
(e) Form AB-260 RDR/RDS Nomination Letter.

The application will be reviewed by an ABSA Design Survey Auditor, Safety Codes Officer. If the written description of the QMS and the RDS nomination are acceptable, then the Design Survey Auditor may request an initial demonstration of the QP procedures prior to accepting the QP as part of the QMS and issuing a Letter of Recognition for the RDS. The initial demonstration will require the RDS performing the QP procedures to present evidence that the QP is fully integrated as part of the QMS and that the resulting DRA is a deficiency-free design submission that can be accepted by ABSA for registration without re-work.

6.1 Letter of Recognition (RDS Letter)

The Letter of Recognition is a letter issued by ABSA, to the manufacturer, that ABSA has accepted the RDS nomination. The person named on the Letter of Recognition can submit designs in accordance with the QP. Each RDS Letter expires when any of the conditions below are applicable:

(a) On the date the manufacturer's QMS (CAP) expires.
(b) On request by ABSA.
(c) On request from the manufacturer.
(d) When no DRA realization activity has occurred within a continuous period of (12) twelve months as part of the QP.
(e) When the person identified in the letter as a RDS leaves employment with the manufacturer.

A person shall not hold more then one valid Letter of Recognition.

PART 2: GUIDANCE

This section provides guidance and recommendations to vessel manufacturers that choose to participate in the QP. This section is intended to be informative and the manufacturer may implement other approaches or methods for establishing an appropriate QMS to achieve compliance with the PESR and QP. Although ISO certification is not mandatory, a vessel manufacturer should attempt to achieve a QMS that could be compliant with the appropriate ISO QMS Standards or be successful in receiving an ISO Certification.

7.0 QMS REQUIREMENTS

(GUIDELINE FOR PREPARATION OF THE QMS TO MEET THE REQUIREMENTS OF QP)

7.1 DRA Realization Planning

The manufacturer should plan and develop the processes required for DRA realization. Planning of the DRA realization should be consistent, wherever practicable, with the requirements of other processes within the QMS.

It is recommended that the vessel manufacturer should determine and address the following, as appropriate:

(a) Quality objectives and requirements for the DRA.
(b) Processes and documents (calculations, checklists, etc.) to provide resources required for DRA realization (RDS, pressure vessel designers, drafters, document control, etc.).
(c) Design requirements, documentation preparation, verification, validation, monitoring, approval, release and submission activities related to the DRA.
(d) Manufacturer’s criteria for DRA acceptance.
(e) Control of records to provide evidence that the DRA realization processes and resulting DRA meet regulatory requirements.

The output of the DRA realization planning should be in a manner suitable to the manufacturer and ABSA’s design registration process.

7.2 Regulatory and ABSA Related Processes

The manufacturer should identify, define and implement processes that result in a DRA that complies with the regulatory requirements. It is recommended that the vessel manufacturer should address:

(a) Requirements specified by the Act and regulations, applicable Information Bulletins, code of construction, owner design requirements, design registration, construction and certification of the pressure equipment.

(b) Administrative and technical requirements related to ABSA design registration process.
(c) Communication processes between the RDS and ABSA.
(d) Requirements or expectations of the end user that are necessary for the specified or intended use of the pressure equipment.

7.3 Requirements Related to the DRA

The manufacturer should review the requirements related to the DRA. This review should be conducted prior to the manufacturer's commitment to submit the DRA to ABSA and should ensure that:

(a) Design requirements are defined.
(b) Design non-compliances or other end user's requirements (in addition to the minimum regulation and code requirements) are resolved and satisfied.
(c) Records of the results of the review and actions arising from the review should be maintained.

Note: Where ABSA or the end user provides specific requirements, such requirements should be confirmed by the manufacturer before the DRA development planning and DRA submission.

7.4 DRA Development and Planning

The manufacturer should plan and control the development of the DRA. It is recommended that during the DRA development and planning, the manufacturer should determine:

(a) The stages of the DRA development and planning.
(b) The appropriate review, verification and validation for each DRA development and planning stage.
(c) The personnel responsibilities and authorities developing and preparing the DRA.

The manufacturer should ensure effective communication between different persons involved in DRA development and planning. The output of the DRA development and planning should be updated, as appropriate, as the DRA development input, output, review, verification, and validation progresses.

Note: The review, verification, and validation of the DRA development and planning have distinct purposes and can be conducted and recorded separately or in any combination, as required.

7.5 DRA Development Inputs

Inputs relating to design requirements should be determined and records maintained. It is recommended that these inputs should include but are not limited to:

(a) Applicable statutory and regulatory requirements.
(b) Applicable Information Bulletins.
(c) Code of construction requirements.
(d) The pressure vessel end user requirements. For example see Appendix KK of Section VIII Div 1.
(e) Information and other inputs essential for the DRA development for a regulation compliant application.

Note: The inputs should be reviewed for adequacy. Requirements should be complete, unambiguous and not in conflict with each other.

7.6 DRA Development Outputs

The DRA development outputs should be in a manner suitable for verification against the DRA development inputs. The verification should be approved by the manufacturer prior to submitting the DRA to ABSA Design Survey for registration. The DRA development process outputs should:

(a) Meet the input requirements for the DRA development,
(b) Provide appropriate and complete information to perform a survey or audit by ABSA,
(c) Contain the design criteria and all other pertinent design information
(d) Include safe operating characteristics that ensure the pressure vessel can be operated safely (consider inspection openings, fluid type, volume, heating surface, etc… as applicable).

7.7 DRA Development Review

At planned stages, the DRA should be reviewed:

(a) To determine if the DRA development meets requirements for registration.
(b) To identify any DRA deficiencies or discrepancies and perform necessary corrective actions.

Note: Participants in such reviews should include representatives of functions concerned with the design and documentation development stage(s) being reviewed/or be performed by a designated person (RDS).

7.8 DRA Development Verification

Verification should be performed at the planned stages to ensure that the DRA development outputs have met the DRA input requirements, see sections 7.4 through 7.6.

The verification results and any necessary actions should be recorded and maintained. A checklist should be developed and signed by the RDS to ensure the DRA is inclusive of all required documents.

7.9 DRA Development Validation

(PRESSURE EQUIPMENT DESIGN INCLUDING SPECIAL PRESSURE COMPONENTS)

DRA validation should be performed at the planned stages in section 7.4, (such as; NDE, proof test, other tests, etc. as applicable) to ensure that the special pressure components and resulting pressure vessel design complies with the registration requirements. Applicable validation should be completed prior to the DRA submission. The recorded validation results and any necessary actions should be provided to ABSA at the time of the DRA submission or maintained for verification by ABSA SCO.

7.10 Control of DRA Development Changes

It is recommended that:

(a) DRA changes should be identified.
(b) Records should be maintained.
(c) The changes should be reviewed, verified, validated, and approved by the RDS before implementation.
(d) The review of the DRA development changes should be part of a management of change.
(e) Changes and any necessary actions should be recorded and maintained for future references.

8.0 COMPETENCY OF RDS

(GUIDELINE FOR ESTABLISHING COMPETENCY)

This section provides guidelines for manufacturers to help identify and nominate a competent person for the RDS role, as part of the QP. The manufacturer may choose to use other methods for establishing competencies than those provided in this document, however the methods used should be documented in the manufacturer's QP. The scope of activities may vary among different manufacturers. A manufacturer may require that the RDS nominee possesses additional or special qualifications to meet competency requirements prior to performing DRA development activities. This section provides guidelines to a RDS nominee to be recognized by ABSA for the RDS role.

8.1 RDS Nominee Requirements

A nominee should comply with the following requirements:

(a) Possess a high school education (12 years or equivalent educational system).
(b) Be employed by the manufacturer.
(c) Should comply with the criteria as described in section 8.2 Qualification Criteria.

8.2 Qualification Criteria

A RDS nominee should have a combined minimum of 10 credit points as described in section 8.3 Education and section 8.4 Experience. Reasonable judgment should be used by the manufacturer when assigning credits. Alternatively, a RDS nominee should complete the manufacturer's defined training program, subject to acceptance by ABSA.

8.3 Education Criteria

(1 CREDIT MINIMUM, 8 CREDITS MAXIMUM)

8.3.1 Technical or Regulatory Training

(2 CREDITS MAXIMUM)

This area of training focuses on Pressure Equipment Safety Regulation and Pressure Vessel Technology courses.

(a) Technology and Applied Science Courses: Completed a course in at least one (1) of the following (or related) subjects: quality systems, engineering, fabrication methods, non-destructive examination, or inspection. A course may be web based correspondence or conducted in a classroom.
(b) Codes and Standards Courses: Completed a course regarding the CSA B51, ASME Sec. VIII Div. 1 or other codes and standards courses offered by the ASME, National Board or other acceptable international codes of construction.
(c) Courses or other training in Pressure Equipment Safety Regulation.
(d) Courses or other training in design of boiler and pressure vessel construction or inspection.

8.3.2 Technology and Applied Science Level of Education

(3 CREDITS MAXIMUM)

(a) Obtained an Engineering Technologist diploma from an accredited post secondary technology and applied science institute.
(b) Obtained an Engineering Certificate.
(c) Completion of a military or merchant marine training course in the area of marine or stationary boilers or pressure vessels.
(d) A National Board In-Service Inspector certificate or an equivalent certification.
(e) Technical Certification and membership by a technical governing body such as "ASET" or other as acceptable to ABSA.
(f) Completion of a power engineering certification program.

8.3.3 College or University Level of Education
(5 CREDITS MAXIMUM)

(a) Associate degree in science, mathematics or engineering (other than Mechanical Engineering). (4 credits maximum)
(b) Bachelor degree in science, mathematics or engineering (other than Mechanical Engineering). (4 credits maximum)
(c) Bachelor, Masters, or PHD degree in Mechanical Engineering. (5 credits maximum)
(d) Master or PHD degree in engineering. (other than Mechanical Engineering) (5 credits maximum)

8.4 Experience
(1 CREDIT MINIMUM, 8 CREDITS MAXIMUM)

One (1) credit point may be assigned for each year of experience associated with design, fabrication, and maintenance of boilers and pressure vessels in the categories below. Credit for concurrent experience in two or more categories should be limited to the experience in one category

(a) Designing Pressure vessels and boilers.
(b) Engineering or design review of pressure vessels and boilers.
(c) Involved with shop or field manufacturing and fabrication processes.
(d) Responsibility for performing repairs, alterations, or maintenance of boilers or pressure vessels in either shop or field.
(e) Involved with quality control systems relating to boiler or pressure vessel design and manufacturing.
(f) Responsible for inspection of boilers or pressure vessels either in-service or during construction including shop or field.
(g) Other experience acceptable to the manufacturer and ABSA.

9.0 CONTINUING EDUCATION
(GUIDELINE FOR ESTABLISHING CONTINUING EDUCATION)

Continuing education for the RDS is recommended to ensure that the RDS maintain their technical knowledge base including new developments of the Act and regulations and administrative changes to the registration process. The manufacturer should develop and document the training plan and processes for the RDS competencies. Changes to the scope of the company's QP may require the RDS to take additional continuing education courses. Each continuing education course should be based on the required knowledge as defined by the manufacturer for each RDS.

It is recommended that:

(a) Each RDS should complete a manufacturers defined and approved training plan appropriate for the scope of the QP.

(b) The training plan may be developed by the manufacturer and accepted by ABSA.
(c) Additional training over and above the minimum QP requirements may be defined by the manufacturer and included in the QP.

Note: Each continuing education training or course should be based on the manufacturer's requirement to maintain an effective QP and accepted by ABSA.

10.0 RESPONSIBILITIES AND DUTIES OF THE RDS

(GUIDELINE FOR ESTABLISHING RESPONSIBILITIES AND DUTIES OF THE RDS)

The manufacturer should develop and document the specific duties and responsibilities of the RDS. A RDS may be assigned various responsibilities in accordance with the manufacturer's QMS. A RDS may perform design and documentation preparation functions as part of the DRA realization. It is the RDS's responsibility to ensure that procedures and processes are in compliance with the DRA realization process.

Duties of a RDS should include, but are not limited to:

(a) Possess a thorough knowledge of the Act and regulations, PESR, applicable Information Bulletins and code of construction requirements.
(b) Perform design and other functions related to DRA.
(c) Report design results, including any non-conforming conditions, as required in the QP.
(d) Verify that the design drawings and documentation are legible.
(e) Monitor the QP and verify that the system is being implemented accordingly.
(f) Verify that all materials chosen in the design are in compliance with the code of construction requirements.
(g) Verify that all welding procedure specifications are registered and applicable for the specific pressure vessel in accordance with the code of construction
(h) Verify that heat treatment requirements are in compliance with the code of construction.
(i) Verify non-destructive examinations and tests are in compliance with the code of construction and have been correctly identified and specified.
(j) Verify that the impact testing requirements or exemptions have been correctly identified and specified.
(k) Establish that correct pressure tests are in compliance with the code of construction.
(l) Verify that design validations and calculations are performed and in compliance with the code of construction.
(m) Verify that there are no discrepancies between any documents included with the DRA (such as between validation, calculation and drawings etc.).
(n) Verify that the stamping or nameplate is in compliance with the code of construction.
(o) The RDS has overall responsibility for carrying out design and other DRA activities in the DRA preparation.

(p) The RDS is responsible for the completeness and correctness of the DRA and will be the main contact between ABSA and the manufacturer related to the DRA.
(q) The RDS should not engage in any activity constituting a conflict of interest.

11.0 REVISION LOG

Edition #	Revision #	Date	Description
1st Edition issued 2016-04-01			
1	1	2017-04-20	- Changes to the Forward - Changes to the Definitions and Acronyms - Editorial changes throughout
1	2	2018-05-15	Reaffirmation
1	3	2019-04-16	Reaffirmation