

# **Inspector Competence Management System Guidelines for In-Service Pressure Equipment Integrity Assessment Programs**

**AB-527**

Edition 2, Revision 0 - Issued 2019-07-15

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## 1.0 INTRODUCTION

Quality management system guidelines established by the Administrator specify tasks that are to be completed by competent personnel. This guidance document is intended to assist Pressure Equipment Integrity Management System Certificate holders (i.e. Owner-User organizations and Integrity Assessment Organizations, certified under the PESR), in developing their own unique processes for assessing inspector competence.

This new Edition of AB-527 supersedes all previous editions and has been developed in consultation with industry groups, including:

- Alberta Refinery & Petrochemical Inspection Association (ARPIA)
- Upstream Chief Inspectors Association (UCIA)
- Generation Utilities Advisory Committee (GUAC)
- Contract Chief Inspectors Association (CCIA)

The integrity management system that an owner must develop includes design, construction, installation, operation, maintenance and decommissioning elements. Each of these elements requires the owner to develop processes to ensure personnel who perform work that can impact the effectiveness of the integrity management system are trained and assessed as competent. This assessment process must be auditable.

This guideline document is intended for owners of pressure equipment and integrity assessment organizations (inspection companies) who assign personnel to conduct inspections and certification of repairs under their Certificate of Authorization Permit.

This document also addresses how owners assign inspectors, under the provisions of the ASME B31.3 piping code, to inspect pressure piping during fabrication, and who in turn certify the inspection (by signing the AB-83) in accordance with Section 31 of the PESR.

The following documents provide examples in developing a competence assessment process for all elements of an integrity management system:

*Cogent - Guidelines for Competency Management Systems for Downstream and Petroleum Sites* ([www.cogentskills.com](http://www.cogentskills.com))

*United Kingdom Accreditation Service (UKAS), RG 0 - Guidelines on the Competence of Personnel Undertaking Engineering Inspections* ([www.ukas.com](http://www.ukas.com))

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 Mike Prefumo, Manager of Inspections at [prefumo@absa.ca](mailto:prefumo@absa.ca).

## 2.0 SCOPE

The scope of AB-527 is limited to competence management of persons who perform in-service inspection activities of pressure equipment under the PESR. To ensure the safe operation of pressure equipment throughout its full lifecycle, organizations that have responsibilities under the pressure equipment safety legislation should know the current recognized good engineering practices to be applied, in order to meet these responsibilities. They must also ensure that these practices are followed appropriately within the framework of Alberta's pressure equipment safety legislation.

AB-512 establishes requirements for the full-lifecycle of pressure equipment under an owner-user integrity management system. AB-512 also describes how the process for the training, assessment and assignment of inspections to the in-service inspector will be audited.

## 3.0 DEFINITIONS

For the purpose of this document, the following definitions apply.

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

**ABSA Safety Codes Officer (SCO)** – means a safety codes officer, designated under the Act, in the pressure equipment discipline. [PESR 1(1)(ee)]

**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)]

**Competence Management System (CMS)** – Documented processes to ensure that persons who perform in-service inspections are always competent to perform the assigned inspection activity.

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

**Employer** – A legal entity that controls and directs a servant or worker under an express or implied contract of employment and pays (or is obligated to pay) him or her salary or wages in compensation. (Business dictionary)

***In-service Inspector (ISI)*** – means a person who holds the required Alberta in-service inspector certificate of competency, has the required competency, and is designated by their employer to perform integrity assessments of pressure equipment under their employer’s quality management system Certificate of Authorization Permit.

***Inspector*** – means an Owner’s Inspector, an In-Service Inspector, or an ABSA Safety Codes Officer, who is responsible for inspecting and certifying the item of pressure equipment.

***Integrity Assessment Organization (formerly known as Inspection Company)*** – an organization that conducts integrity assessments on behalf of pressure equipment owners under a Certificate of Authorization Permit (CAP) issued per PESR Section 11(2).

***Owner-User*** – an owner that has provided an Integrity Management System in accordance with the Pressure Equipment Safety Regulation and has been issued a quality management system Certificate of Authorization Permit under PESR Section 11(3).

## 4.0 REFERENCE PUBLICATIONS

A full listing of ABSA documents is available on [absa.ca](http://absa.ca) website.

***AB-506 Inspection & Servicing Requirements for In-Service Pressure Equipment***  
Specifies requirements for integrity assessments (in-service inspection) of pressure equipment and pressure relief valve servicing.

***AB-512 Owner–User Pressure Equipment Integrity Management Requirements***  
Specifies quality management system requirements for owners who are required to hold a Certificate of Authorization Permit (CAP) under PESR section 11(3).

***AB-515 Quality Management System Requirements for Integrity Assessment Organizations***  
Specifies the types of integrity assessment activities which are required to be carried out by an organization having Certificate of Authorization Permit, and when such a permit is required under PESR section 11(2). It also provides guidance as to the required content of a Quality Management System in order for it to be acceptable to the Administrator.

***AB-513 – Pressure Equipment Repair and Alteration Requirements***  
Specifies the requirements for post-construction repair and alteration of pressure equipment by an organization having Certificate of Authorization Permit under PESR section 40.

### AB-526 In-Service Pressure Equipment Inspector Certification Requirements

Sets forth the qualification and certification requirements for persons who conduct integrity assessments of pressure equipment installed in Alberta.

## **5.0 REFERENCED INDUSTRY PUBLICATIONS:**

Cogent - Guidelines for Competency Management Systems for Downstream and Petroleum Sites

United Kingdom Accreditation Service (UKAS), RG 0 - Guidelines on the Competence of Personnel Undertaking Engineering Inspections

Engineering Equipment Users Association (EEMUA) - Publication 193 - Managing Competence Assurance for Personnel Undertaking In-service Inspection of Pressure Equipment

Standards Council of Canada - CAN/CSA-ISO 10015-00 - Quality Management - Guidelines for Training

Australian/New Zealand Standard - AS/NZS 4481:1997 - Pressure Equipment - Competencies of Inspectors

ISO/IEC 17020 - Requirements for the Operation of Various Types of Bodies Performing Inspection

## **6.0 COMPETENCE MANAGEMENT SYSTEM GUIDELINES**

This section specifies the competence management guidelines for persons who perform integrity assessments under the PESR.

Owner-users and integrity assessment organizations, (hereinafter referred to as an inspection organization) who inspect and certify in-service pressure equipment, including post construction inspection of repairs, must hold the required Alberta quality system Certificate of Authorization Permit.

The inspection organization must maintain suitable documented processes and records, identified in their quality system documentation, to demonstrate they have established an effective competence management system in accordance with AB-527.

The extent of documentation required to demonstrate the competence of the inspection organization's inspection personnel will depend on the complexity of the equipment inspected, the range and type of inspection, the organization's requirements, and on the level of technical support and supervision available within the organization.

The owner must have a process including, but not limited to, the following elements:

- Identify the inspection needs.
- Establish the competency needed to satisfy the inspection needs identified.
- Identify the training required to meet the competency requirements.
- Identify the assessment method and documentation of the assessment.
- Develop an authorization process whereby the owner authorizes the deemed competent inspector to perform certain tasks.
- Establish a process for monitoring inspector performance.
- Establish a re-assessment criteria and an interval for the re-assessment.
- Document the entire process in a manner that can be satisfactorily demonstrated to ABSA at the time of an audit.

## **7.0 COMPETENCE MANAGEMENT SYSTEM DEVELOPMENT GUIDANCE**

This section provides information to assist integrity assessment organizations in developing an effective competence management system demonstrating the competence of persons who perform in-service inspection activities and also provides recommended competence guidance information. This guidance information is not compulsory but by following the guidance information an organization should generally be doing enough to demonstrate that the requirements established in AB-527 are being met.

This section also provides information that can assist ABSA, owners and other users in evaluating an inspection assessment organizations QMS.

The extent needed to ensure inspection personnel are competent will depend on the type of facility and range of inspection. For example, the skills required to inspect piping on a small oil and gas facility may be relatively simple. Whereas for process piping on a major refinery or chemical plant, a comprehensive program in accordance with API 570 and formal risk-based inspection program, may be needed.

The Appendices, of this document, provide additional guidance information to assist organizations in developing an effective competence management system.

The organization should consider the relevant recognized engineering practices when developing their competence management system (CMS). These include publications, listed in section 5.0, provide guidance to assist organizations in developing an effective competence management system. It should be noted the application of guidance information must be considered within the framework of the Alberta pressure equipment legislation and requirements documents.

## 8.0 INSPECTOR COMPETENCE FOR REPAIRS

Inspector competence for certifying repairs is referenced throughout AB-513. The minimum training requirements for repair inspections are specified in section 9 of the AB-513. The competence of the Inspector certifying the repair must be relevant for the scope of the repairs and the Inspector must be authorized by the owner to inspect and certify these repairs. The process must identify how the scope of repairs is determined and defined. Appendix 1 contains a sample checklist for the documentation of competence assessment for the Inspector certifying repairs.

## 9.0 OWNER'S INSPECTOR FOR B31.3 PIPING FABRICATION

The owner must assign an owner's inspector whenever B31.3 piping is fabricated. The responsibility of the owner's inspector and the minimum qualification of the owner's inspector are defined in B31.3 2016, paragraph 340.4:

*“(a) The owner’s Inspector shall be designated by the owner and shall be the owner, an employee of the owner, an employee of an engineering or scientific organization, or of a recognized insurance or inspection company acting as the owner’s agent.*

*(b) The owner’s Inspector shall meet one of the following requirements:*

*(1) have at least 10 years of experience in the design, fabrication, or examination of industrial pressure piping. Each 20% of satisfactorily completed work toward an accredited engineering degree shall be considered equivalent to 1 year of experience, up to 5 years total.*

*(2) have a professional engineering registration or nationally recognized equivalent with at least 5 years of experience in the design, fabrication, or examination of industrial pressure piping.*

*(3) be a certified welding inspector or a senior certified welding inspector as defined in AWS QC1, Standard for AWS Certification of Welding Inspectors, or nationally recognized equivalent with at least 5 years of experience in the design, fabrication, or examination of industrial pressure piping.*

*(4) be an authorized piping inspector as defined in API 570, Piping Inspection Code: In-service Inspection, Rating, Repair, and Alteration of Piping Systems, with at least 5 years of experience in the design, fabrication, or examination of industrial pressure piping.*

*(c) In delegating performance of inspection, the owner’s Inspector is responsible for determining that a person to whom an inspection function is delegated is qualified to perform that function.”*



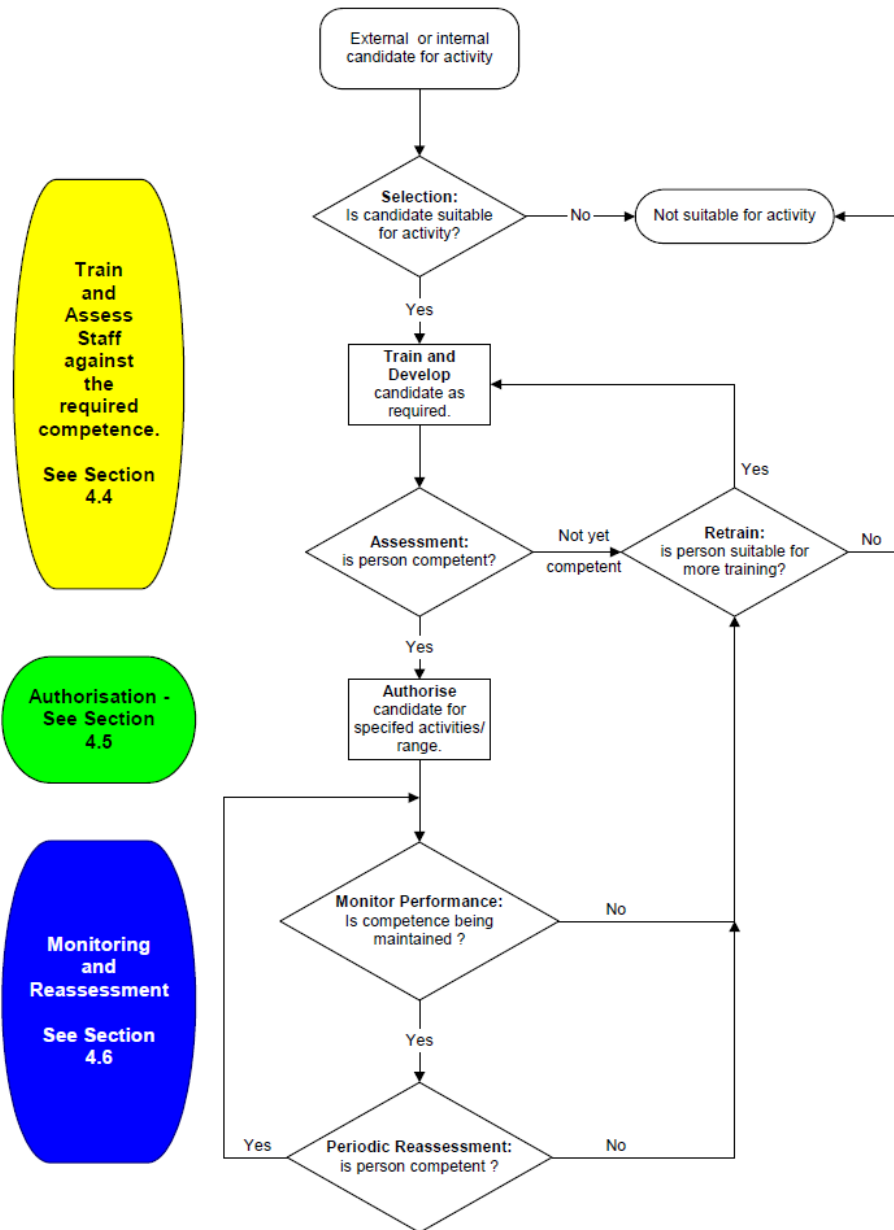
Owners have expressed difficulty in obtaining the services of a qualified owner's Inspector as defined in B31.3, and have asked for clarification from ABSA on the expectations for the designated owner's inspector and alternative qualifications for an inspector to whom duties are delegated in accordance with point (c) above.

The owner must establish and implement a formal "assignment of duty" process for the owner's inspector. The process should address the owner's inspector qualifications as specified in B31.3 340.4(b). In delegation of inspection, the process must specifically address the competence and assignment of inspections to competent persons per B31.3 340.4(c).

The preceding paragraph may be used to establish the process whereby a scope of piping inspection is identified; the competency required to perform the inspections as the owner's Inspector is identified; a suitable candidate is trained and evaluated to perform these identified inspections; and this inspection function is delegated to the candidate. The candidate may then be authorized by the owner to inspect the piping and certify the inspections by signing off on the AB-83 as the owner's Inspector. The method used to identify the scope of piping inspection should be defined. This delegation process shall be documented and auditable.

## 10.0 APPENDIX 1 – Example of Inspector Competency Management Process

The following flowchart (UKAS RG 0) details an example of a process that may be used for the establishment of competence, authorization, monitoring and reassessment of inspection personnel.



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## 11.0 APPENDIX 2 – Example of Classification of In-service Inspectors

The following provides an example of how an employer may choose to classify and assess ISI's within their organization. Included are lists of typical competencies for types of equipment inspections. The applicable competencies listed shall be covered in the competence management system.

The following is an example and each employer is responsible to determine which methods are most appropriate for their organization with regard to the classification and assessment of ISI personnel.

### **Qualification and experience of ISI Inspectors**

Suggested minimum experience and competence requirements for ISI's are defined below. The employer must determine any additional competencies needed to fulfil the duties of the inspectors defined.

#### **ISI Level 1 (or however named) Inspector**

This inspector must hold the required ISI Certificate of Competence by meeting the requirements defined in AB-526. The scope of inspection is limited to that designated by the employer under the employers Certificate of Authorization Permit.

This inspector must be competent to perform basic unsupervised inspections in accordance with the inspection plan (strategy) approved by a Level 2 or 3 (or however named) inspector.

The inspection results and future inspection requirements (including inspection and PRV servicing intervals) must be approved by a Level 2 or 3 Inspector.

#### **ISI Level 2 (or however named) Inspector**

This inspector will also require the following knowledge and skills in addition to the skills and certification required for a Level 1 Inspector:

- develops and updates the inspection plans and strategies by understanding damage mechanisms corrosion circuits etc.
- reviews NDE and inspection techniques and provides oversight of contractors
- provides training and mentoring services
- assesses the competence of inspectors to perform the specific inspection activity. Inspectors must also be assessed and appropriate documentation be provided
- provides technical oversight of Level 1 inspectors
- reviews and approves inspection reports and PRV servicing reports
- approves future pressure equipment inspection requirements and intervals and PRV servicing intervals
- updates inspection strategies, plans

- makes sure any outstanding items are followed up and acted upon,
- performs activities for repairs and alterations as established in AB-513

Persons who perform the above activities must have at least three years experience working as a Level 1 ISI.

Appropriate documentation, certified by the Level 3 (e.g. Chief Inspector or however named) from within the company, must be on file to support the appointment of a Level 2 inspector.

### **ISI Level 3 (or however named) Inspector**

The level of experience must be appropriate for the type of facility & organization and may be designated as the person in charge of the company inspection program. As a minimum, this shall be at least four years working as a Level 2.

Appropriate documentation, certified by a senior management person management rep from within the company, is to be submitted to ABSA for acceptance prior to appointing a person to act as Chief Inspector for the company.

### **Equivalent Experience**

Notwithstanding the above, owner-users who have the appropriate organization structure and in-house technical resources, and maintain a robust in-house integrity assessment and competence management program, may provide appropriate documentation to justify the appointment of inspection staff who do not meet the experience requirements established above for Level 2 and Level 3 Inspector.

## 12.0 APPENDIX 3 – Example of Competency profile for Repair Inspector

Define the scope of the repairs.

Training and competence assessment must be based on the scope of repairs.

Assessment to an established company standard to be: written, oral and/or demonstrated.

Competency: Training, Knowledge and Experience			
Elements	Assessment Criteria	Comments: (descriptions and limitations if applicable)	
<b>Certification/Verification/assessment by the Supervisor</b>			
<input type="checkbox"/>	In-service Inspector		
<input type="checkbox"/>	- API 510 or		
<input type="checkbox"/>	- National Board "IS"		
<input type="checkbox"/>	NDE certification		
<input type="checkbox"/>	Technologist diploma		
<b>Reference Materials</b>			
<input type="checkbox"/>	Company policies and procedures		
<input type="checkbox"/>	Company repair standards		
<input type="checkbox"/>	AB-512		
<input type="checkbox"/>	AB-513		
<input type="checkbox"/>	PCC-2		
<input type="checkbox"/>	ASME Section VIII Div 1		
<input type="checkbox"/>	API 577		
<input type="checkbox"/>	API 582		
<input type="checkbox"/>	NBIC		
<input type="checkbox"/>	NDE procedures		
<input type="checkbox"/>	PWHT procedures		
<input type="checkbox"/>	Other applicable codes		
<b>Administrative</b>			
<input type="checkbox"/>	Repair organization QC program		
<input type="checkbox"/>	AB-40 & completion guide		
<input type="checkbox"/>	Legislation: PESR		
<b>Repair Inspection Experience</b>			
<input type="checkbox"/>	Coordinated "X" number of repairs under direct supervision by a senior inspector or supervisor		



## REVISION LOG

<b>Edition</b>	<b>Rev #</b>	<b>Date</b>	<b>Description</b>
1 <sup>st</sup> Edition	0	2013-10-16	New Document
2 <sup>nd</sup> Edition	0	2019-07-15	New Edition – full revision