Introduction

- An overview of ABSA
- NDT personnel certifications in ASME Code and Alberta Regulations
  - New construction, in-service, alteration, and repair applications
- Key Requirements of Section VIII Div. 1 – Ultrasonics in lieu of RT
- Tips for success
- Common errors
- Questions
The Role of ABSA

- ABSA is delegated by the Alberta Government for the delivery of pressure equipment safety program services in Alberta, and to carry out jurisdictional duties under the Safety Codes Act.
- The Minister of Municipal Affairs appoints the Administrator.
- Michael Poehlmann is the Chief Inspector and Administrator for the province of Alberta.
ABSA 2014 Statistics

- 211,042 Registered pressure vessels in AB (subject to fees)
- 11,392 Completion inspections by ABSA
- 10,115 Completed design registrations
- 19,115 In-service inspections by ABSA
- 10,932 Power Engineering exams
- Over 1,300,000 km driven by ABSA (90% by Inspectors)
- 36 Incidents reported to ABSA
ABSA Overview

- ABSA does not issue QMS – Certificate of Authorization Permits to perform NDE
- National Board (NB), American Society of Mechanical Engineers (ASME), American Petroleum Institute (API), and Alberta Regulations make numerous references to NDE requirements and the Inspector (AI – ABSA SCO), Authorized Inspection Agency (AIA - ABSA), or Jurisdiction (ABSA)
AB-515 Definition for an Inspection Company

“Inspection Company”means a company that provides third party in-service inspection program services and holds the required Alberta quality management system certificate of authorization permit to perform integrity assessments under the PESR.
AB-515 Definition for an Inspection Company

The inspection company and its staff responsible for carrying out integrity assessments shall not be the manufacturer, supplier, installer, purchaser, owner, user or maintainer of the items which they inspect, nor the authorized representative of any of these parties.
Hierarchy of the Act, Regulations, and Codes

- Safety Codes Act
- Regulations
- Ministerial Orders
- Variances, Administrative Requirements, and Interpretations
- CSA B51
- ASME Piping Codes
- ASME Boiler and Pressure Vessel Codes
- Other Codes and Standards
NDE References - Code Example

- CSA B51, 4.11
  - “Non-destructive personnel associated with the quality control system shall be certified in accordance with CAN/CGSB-48.9712/ISO 9712 or other standards acceptable to the regulatory authority.”
NDE References - Code Example (New Construction)

- ASME Section VIII, Div. 1, UW-53 (UT)
  - “The written examination procedure shall be available to the Inspector and shall be proven by actual demonstration to the satisfaction of the Inspector to be capable of detecting and locating imperfections described in this Division.”
NDE References - Code Example (In-Service)

- API 510, 4.1.2 j) Owner/User Systems and Procedures (Referenced Document)

  - “Ensuring that all **jurisdictional** requirements for pressure vessel inspection, repairs, alterations, and rerating are continuously met.”
NDE References - Regulatory Example (In-Service)

- AB-506, 14.0 Nondestructive Examinations (NDE)
  - “The NDE method used must be suitable to identify the potential damage mechanisms listed in the equipment plan. ASME Section V covers requirements for the various NDE methods. Documented procedures shall be maintained for the NDE methods used and be available to the Inspector.”
The Role of ABSA in NDE

- NDE is a critical element in pressure equipment safety
- ABSA is required by the Safety Codes Act to ensure that all code and regulatory requirements are fulfilled, including all NDE requirements
New Construction
Personnel Qualifications - Section VIII, Div. 1 (New Construction)

- **UW-54 (a)**
  - Requires NDE subcontractors to have “Written Practices” in accordance with SNT-TC-1A or CP-189
  - National or international Central Certification Programs such as the ASNT Central Certification Program (ACCP), may be used to fulfill the examination and documentation requirements of the employers written practice

- **UW-54 (b)**
  - NDE Personnel shall be qualified by examination
Personnel Qualifications - Section V (New Construction)

- **T-120 (f)**
  - Allows the use of ACCP or ISO 9712:2012 based programs to fulfill the training, experience, and examination requirements as specified in the employers written practice.

- **T-150 (a)**
  - Requires a procedure demonstration to be performed to the satisfaction of the inspector. This applies to MT, PT, and UT.
Personnel Qualifications - Section VIII, Div. 1 (New Construction)

- Mandatory Appendix 6 and 8
  - Allows the manufacturer to use examiners who are “competent” in the technique to perform MT and PT
  - Again, it still must be performed IAW a written procedure per T-150 of Section V and demonstrated to the A.I.
In-Service Equipment, Repairs, and Alterations
Personnel Qualifications – In Service Pressure Equipment

- **AB-506, 14.0 Nondestructive Examination**
  - Examiners who perform ultrasonic shearwave examinations must have demonstrated competence to detect and evaluate the potential flaw and hold a CGSB Level 2 certification in this method. SNT-TC-1A Level II certification IAW the SNT-TC-1A edition listed in the current ASME Section VIII Div. 1 Code is also allowed, provided this is acceptable to the owner.
Personnel Qualifications – In Service Pressure Equipment

- AB-506, 14.0 Nondestructive Examination

  - Examiners employed by NDE contractors who perform UT, MT, or PT examinations of in-service pressure equipment must hold a level I or II CGSB or SNT certification.
Personnel Qualifications – In Service Pressure Equipment

- **AB-506, 14.0 Nondestructive Examination**
  - Examiner directly employed by an owner user or certified inspection company and performs UT, MT, or PT examinations under their employers integrity assessment program do not require CGSB or SNT certification, provided they have appropriate documented training and experience, have been certified competent in the method, and suitable records are maintained.
  - In all cases, written procedures are required.
ASME Section VIII Division 1
UT in Lieu of RT
ASME Section VIII Division 1
UT in Lieu of RT

- The following provides an overview of some key requirements of the ASME code when automated or semi-automated ultrasonics is used in lieu of RT
- To be fully code compliant, all requirements of the code need to be met
ASME Section VIII Div. 1
UT in Lieu of RT

- **UW-51(a)(4)**
  - Allows the use of UT per the requirements of 7.5.5 of Section VIII, Division 2 where the thickness is ¼” (6mm) or greater
Section VIII Division 2
UT in Lieu of RT

7.5.5.1

Requires that the ultrasonic examination shall be performed IAW a written procedure conforming to the requirements of Section V, Article 4, Mandatory Appendix VIII.
Section V – Article 4
Mandatory Appendix VIII

- VIII-410
  - Only applies when automated or semi-automated ultrasonic examination is performed for fracture mechanics based acceptance criteria

- VIII-421.2
  - Requires procedure qualification per Mandatory Appendix IX
Section V – Article 4
Mandatory Appendix VIII

Table VIII-421
- Provides written procedure and procedure qualification requirements additional to that of Article 4
  - Scan Plan
  - Computer software
  - Scanning technique (auto vs. semi auto)
  - Flaw sizing methodology
  - Search unit mechanical fixturing device
  - Scanner and adhering and guiding mechanism
Section V – Article 4
Mandatory Appendix VIII

VIII-431

- Allows for the examination of transverse reflectors to be performed manually
- The acceptance criteria for a transverse manual scan remains per Section VIII, Division 2, Tables 7.8, 7.9, 7.10, or 7.11
Section V – Article 4
Mandatory Appendix VIII

VIII-434.2.4

- Details the scanner block requirements
  - Shall be within the lesser of ¼” (6 mm) or 25% of the material thickness to be examined
  - Shall have an adequate number and position of side drilled holes to confirm each probe or probe pair, as positioned per the scan plan
  - The calibration block per Article 4, Figure T-434.2.1 may be used as a scanner block when suitable reflectors exist
Section V – Article 4
Mandatory Appendix VIII

- **VIII-442**
  - Requires the scanning data to be saved electronically in a unprocessed form

- **VIII-488**
  - The Manufacturer is responsible for the review, interpretation, evaluation, and acceptance of the completed scan to ensure compliance with Article 4 and Appendix VIII. This shall be done before presentation of the scan data and documentation to the Inspector
Section V – Article 4
Mandatory Appendix IX

**IX-435.1**
- Article 4 paragraphs T-434.1.2 to T-434.1.7 apply to the demonstration blocks

**IX-435.2**
- Demonstration block shall be prepared by welding or the hot isostatic process provided the acoustic properties are similar

**IX-435.3**
- The demonstration block shall be within 25% of the thickness to be examined
Section V – Article 4
Mandatory Appendix IX

- IX-435.4
  - The demonstration blocks weld joint geometry shall be representative of the production joints details

- IX-435.5
  - The demonstration block requires two surface flaws (representing OD and ID surface) and one subsurface flaw, when the scan plan subdivides a weld into multiple examination zones, a minimum of one flaw per zone is required
Section V – Article 4
Mandatory Appendix IX

- **IX-435.6**
  - Establishes the maximum flaw size

- **IX-435.7**
  - Allows for only one surface flaw provided requirements are met

- **IX-482**
  - Must record indications that exceed the specified evaluation criteria
  - Flaw must be sized equal to or greater than actual size (length and height)
Section VIII Division 2
UT in Lieu of RT

7.5.5.1(a)

- Requires the area of inspection to include the volume of the weld plus 50 mm (2 in) on each side of the weld for thicknesses 200 mm (8 in) or over
- For thicknesses 200 mm (8 in) and less, 25 mm (1 in) or $t$ on each side of weld is required
- Has provisions for reduced area’s when the HAZ is known, additional requirements exist
Section VIII Division 2
UT in Lieu of RT

7.5.5.1(b)
- Requires a straight beam examination, may be manual or automated (if demonstrated)

7.5.5.1(c)
- Requires personnel to be certified IAW their employers written practice, using SNT-TC-1A or CP-189 as a guideline
- Only UT Level II or III personnel shall analyze the data or interpret the results
7.5.5.1(d)
- Requires that contractor qualification records of certified personnel shall be approved by the Certificate Holder (manufacturer) and maintained by their employer.

7.5.5.1(e)
- Personnel who acquire and analyze UT data shall participate in the qualification of the procedure per Section V, Article 4 Mandatory Appendix IX.
Section VIII Division 2
UT in Lieu of RT

- **7.5.5.2**
  - Provides requirements for flaw sizing

- **7.5.5.3**
  - Notes that acceptance criteria for UT is per Tables 7.8, 7.9, 7.10, or 7.11
Tips for Success

- Read the entire applicable section when reviewing any code
- Make sure you read all the notes
- Review the references to other sections of the code
- If after reviewing the code you are still unsure, contact your local ABSA SCO
- Make every examination code compliant
Common Errors

- Reports do not contain the minimum information required by ASME Section V
- Technicians cannot produce evidence of certification
- Eye tests are not current
- Incorrect acceptance criteria reported
- Section VIII Div. 1 PAUT and TOFD done to the code case
- Reports not accepted by the client
Questions?