AB-40a Guide for Completing Form AB-40

1.0 PURPOSE

To provide guidance for completing Form AB-40, *Boiler and Pressure Vessel Repair and Alteration Report*.

2.0 APPLICATION

Form AB-40 shall be used to document and certify each repair and, alteration, including any rerating to boilers, pressure vessels, thermal liquid heaters, direct and indirect fired heaters, completed in Alberta under the Safety Codes Act and Regulations.

3.0 GENERAL

AB-513 *Pressure Equipment Repair and Alteration Requirements* was developed to provide detailed guidance for post-construction repair and alteration activities. It defines Alberta requirements that must be met for post construction repair and alteration activities, and includes information regarding the use of Form AB-40. Organizations involved in repairs and alterations to pressure equipment must ensure that they follow all the requirements of AB-513.

An alteration and a repair are defined in AB-513 as:
Alteration means any change to an item of pressure equipment as described in the original Manufacturer's Data Report that requires a change of design calculations or otherwise affects the pressure-containing capability of the item of pressure equipment. Non-physical changes such as a change in the maximum allowable working pressure (internal or external) or design temperature of a pressure retaining item is an alteration. A reduction in minimum design metal temperature is also an alteration.

Repair is defined as any work necessary to restore pressure equipment to a condition suitable for safe operation at the existing design conditions. Form AB-40 is required for documenting and certifying that the repair/alteration was done in accordance with the Safety Codes Act and Regulations and AB-513. Any welding on the pressure envelope and any alteration, including any change in the pressure and/or temperature rating, must be documented on Form AB-40.

Form AB-40 and guide AB-40a are posted on ABSA's website http://www.absa.ca under ABSA Forms.

Form AB-40 is not used for repairs and alterations to piping systems. These are documented on Form AB-83 *Pressure Piping Construction and Test Data Report*. AB-516, *Pressure Equipment Regulation User Guide*, Section 31, provides information on the use of Alberta piping construction forms.

4.0 INSTRUCTIONS

The following provides information to assist in completing each item listed on Form AB-40. The headings or numbers shown correspond to those on the AB-40. Where the term 'repair' is used in this guide it may also mean alteration.

Side A

(A)# - Alberta Identification Number assigned by ABSA Safety Codes Officer (SCO).
Owner Equipment Number – provide vessel identification number when assigned by the owner
Repair organizations job # – provide repair organization's job number

Repair and/or alteration (check the appropriate box)
Partial - check box if this is part of a repair/alteration which will be completed by another repair organization. Form AB-40 must be completed and certified and provided to the repair organization who completes the final repair
Final - check box if this is the report for the completed repair/alteration.

1. Repair organization name and address: Alberta Quality Program (AQP) Certificate of Authorization permit number and expiry date of the organization doing the actual repair or alteration.
2. Name and address of the owner of the boiler or vessel: Name and address of the plant or facility where item is installed (LSD, street address, and/or facility name).
3. Item name used by owner, CRN *(Canadian Registration Number)*, name of manufacturer, and manufacturer's serial number.
4. Original Design Conditions: List the MAWP, temperature and MDMT and units, as shown on the original data report/nameplate. If the item has previously been re-rated, use the values from the existing re-rate nameplate or supporting AB-40. For shell and tube heat exchangers and multipart vessels, all design conditions are to be included. Shellside and tubeside are for shell and tube exchangers; jacket is for jacketed vessels.
5. New Design Conditions: Show the new design conditions. If the design conditions have not been changed the information shown in item 4 should be recorded. Note: the allowable design stresses of ASME Code section referenced when the unit was first manufactured must be used in determining the new design conditions.
6. Description of Defect: Provide a description of and the location and type of damage that caused the repair. e.g.:

Location:	Internal/external, in nozzles, heads, etc.
Type:	General corrosion/ erosion, pitting
	Cracking, blisters, creep fatigue, hydrogen attack etc.

7. Original Code: Indicate the ASME code edition, year and addenda that was used when the item was manufactured.
8. The current Code of construction should normally be used for performing the work (e.g. quality control requirements, fabrication, welding, performing NDE heat treatment and any pressure tests).
9. Exact scope of work and step by step description of the repair and alteration methods used must be identified. Attach additional pages as required, and reference any supporting documents that provide the detailed information needed to complete the repair or alteration. These may include drawings, specifications, detailed repair and alteration procedures.
10. Indicate the minimum preheat temperature. If post weld heat treatment is specified, show the holding time and temperature.
11. Type of NDE used and extent: e.g.: magnetic particle examination (MT) of root and completed butt weld repairs, 100% Radiographic testing (RT) examination of long seams, and ultrasonic testing (UT) flaw examination of all repaired cat D nozzles.
12. Pressure Test: item or part (shellside, tubeside, or jacket) the test has been done on
    a) Hydrostatic test pressure with units of measure (psi or kPa).
    b) Other type of test used in lieu of, or in addition to, hydrostatic pressure test i.e. pneumatic test, sensitive leak test, service test etc. Indicate type of test and pressure as applicable.

Side B

(A)# - Alberta Identification Number
Owner Equipment Number: Vessel identification number when assigned by the owner.

13. Material: List all pressure retaining material used in the repair and any existing base material that is welded on. Include the material specification, grade, thickness, schedule, diameter, classification, etc., as applicable. Indicate units of measure (in or mm).
14 Welding procedure: Identify the Alberta Registration (WP) Number and the specific ABSA approved welding procedure specifications numbers that are used.
15. Welded replacement parts: Include description of supplied vessel part for which a Partial Data Report or Partial Repair Report (AB-40) has been included/attached to this report. **Note** - new parts must be certified on a *Manufacturer's Partial Data Report*.
16. This section is used to identify items that the owner/client has assumed responsibility for completing when the owner/client is not the repair organization who does the repair/alteration.

    Check off the items that the owner/client has assumed responsibility for controlling or supplying. The owner/client must have a *Certificate of Authorization Permit* for the scope of work to be performed to be able to assume responsibility for items: **c)** controlling the material that is to be used, **d)** welding controls, **e)** nondestructive examinations, **f)** heat treatment, and **g)** any pressure tests.

17. Remarks: Any relevant additional information in regard to the repair and/or alteration that is not identified elsewhere in the report.
18. Certificate of Compliance:
    a) Provide name of repair organization including:
        - AQP Certificate number and expiry date of the repair organization
        - Signature and date of the repair organization's QC representative
        - Printed name of repair organization's QC representative
    b) This section is completed when owner/client assumes responsibility for items identified in section 16.
        - AQP Certificate number and expiry date - Note: If the owner/client has only identified responsibility for items a) and b) in section 16, N/A may be shown for this item.
        - Signature of owner/client QC representative and date
        - Printed name of owner/client QC representative
19. Date when the repair/alteration was completed.
20. Certificate of Inspection:
    a) In-service Inspector Certification (ISI)
    This section is completed when the repair is inspected and certified, by an Owner-user or Inspection Company AQP certificate holder, as allowed per AB-513
        - Owner-User/Inspection Company name and Alberta quality program Cert #
        - ISI inspector signature and date
        - ISI inspector printed name
    b) Certified by ABSA SCO when repair/alteration work is inspected by ABSA

Report Reviewed and Accepted by ABSA SCO – for AB-40 forms which are certified by an Owner-user, the ABSA SCO shall complete this portion after reviewing and accepting the document to ensure that it was properly completed prior to filing in ABSA records.