ABSA
the pressure equipment safety authority

THE PRESSURE NEWS

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CAUTION

Previous issues of The Pressure News may contain information which is outdated or no longer valid. Please be cautious when using information from old articles.

ABSA'S BOARD OF DIRECTORS

2010 will see a number of changes on ABSA's Board of Directors. Warren Fraleigh and Dr. Brian Larson stepped down from the Board this Spring after they both served the maximum 6 years. Warren was the Minister's appointment representing the general public on ABSA's five member board. Brian represented the Education sector. We would like to take this opportunity to thank Warren and Brian for their significant contributions and valued leadership.

In February 2010 Dale Myggland was appointed to ABSA's Board by the Minister of Alberta Municipal Affairs as the public safety representative. Dale is the General Manager of Davco Welding Ltd. in Wainwright.

The Board also invited Dr. Gordon Nixon to join the Board and fill the Education sector vacancy after being selected by a 3-member nominating committee process that consisted of a Board member, the Assistant Deputy Minister of Municipal Affairs and a member of the public. Dr. Nixon is Vice President Academic at SAIT.

We welcome Mr. Myggland and Dr. Nixon to the Board. They will be joining John Ell, Vice President, Operations, ATCO Power; Don McFarlane, President and General Manager, Cessco Fabrication and Engineering Ltd.; and Dave Rushford, Vice President, Business Services, Cenovus Energy Inc.

The Board elected Mr. Rushford Board Chairman in December 2009. ❖

Mr. Dale Myggland

Dr. Gordon Nixon

PRESSURE WELDERS REGULATION

The Pressure Welders Regulation AR 169/2002 has been amended by Alberta Regulation 71/2010. The amendment, effective May 30, 2010, extends the period of validity of Grade C Pressure Welder Certificate of Competency to a maximum of 24 months and also addresses the renewal of Welding Examiner Certificate of Competency. ❖

Improper Use of Vessels Manufactured For Propane

On occasion, vessels manufactured for use as propane storage vessels are found to be improperly utilized as air receivers or other services.

A recent example of this would be two vessels originally manufactured for use in LPG – Propane service – each of volume 2000 USG, MAWP of 250 psi @ 115°F and -20°F, 48″ OD and 273″ in length. The vessels were manufactured without manway openings to facilitate internal inspections. These vessels were found installed in an outdoor location where operating temperature could fall well below -20°F. The vessels were supplied with air from the plant's instrument air system which was dried to a -40° C water dew point.

The company involved pursued discussions with ABSA in order to explore the possibilities to rectify the problem of the vessel's improper use. Eventually a course of action was identified that was deemed acceptable. Actions taken by the company included:

- To make the air system meet the classification for the vessel to be in a "non-corrosive" environment the air dryer system was upgraded to the capability of achieving a -46° C dew point. This allows for consideration of possible exemption for an inspection opening under Section 10(3)(a) of the Pressure Equipment Safety Regulation and Paragraph UG-46(a) of ASME Section VIII Division 1.
- The vessel operating pressure and safety valve setting was reduced from a maximum of 250 psi to a maximum of 175 psi.
- The vessels were heat traced and insulated to ensure that the operating temperature of the vessels would not drop below the minimum design temperature.
- The designated usage was changed to non-corrosive air.

There have also been occasions where pressure vessels for propane were used as anhydrous ammonia (NH_3) storage vessels. Pressure vessels for use in NH_3 service must comply with requirements of Clause 7.6 of the CSA B51 Code; and hence, pressure vessels manufactured for propane may not be found acceptable.

While sometimes it may be possible for Owners to find solutions to this type of a problem, it is far better when, in the design stage, the proper vessel applications are given the appropriate review and consideration. ❖

Field Assembled ASME Section IV Cast Iron Sectional Boiler

All boilers require documentation of construction. Most boilers are completely constructed at a shop by an authorized manufacturer. The construction inspection, testing and documentation rules are clear for most types of firetube and watertube boilers. However, many cast iron sectional heating boilers are field assembled by someone other than the manufacturer. This article describes the assembly inspection, testing and documentation requirements for field assembled cast iron sectional heating boilers.

Following assembly, the boiler has to successfully undergo a hydrostatic pressure test. Steam boilers are to be hydrostatically tested to 310 kPa (45 psi) and hot water boilers to 1 ½ times the maximum allowable working pressure. If a dial pressure gauge is used in the hydrostatic test, the gauge must be calibrated and shall be graduated over a range of about double the intended maximum test pressure. In no case shall the range of the pressure gauge be less than 1 ½ nor more than 4 times the test pressure.

In all cases, a name plate shall be attached to the boiler casing by the manufacturer or assembler. The nameplate shall include the information specified in section 28 of the Pressure Equipment Safety Regulation.

Assemblers (installers) responsible for field assembly and pressure testing of cast iron sectional boilers must supply an ABSA safety codes officer (SCO) with a completed *Installation Report for ASME Section IV Cast Iron and Cast Aluminum Sectional Boilers,* ABSA form AB-8.

Depending on its application (see Part HG Article 4 of ASME Section IV), the safety (pressure relief) valve installed on the boiler must bear an ASME V or HV symbol stamping. The set pressure of the safety valve must not be set higher than the maximum allowable working pressure of the boiler. Also, the relieving capacity of the valve must exceed the heat output of the boiler.

Last but not least, the operating controls and the safety devices must be properly verified before the boiler can be turned over to the operator or the owner. ❖

Fraudulent Power Engineer Certificate

Prosecution has been recommended in a recent case of a power engineer who had fraudulent certificates filed with an employer.

An Alberta employer conducted an audit of power engineer certification. Upon checking the Alberta Power Engineers Directory posted on the ABSA website, the employer could find no listing for a power engineer. A subsequent check by ABSA confirmed that there was no record of certification for that person. ABSA has recommended prosecution of the individual for working as a power engineer without the appropriate certification and for holding a fraudulent certificate.

Employers are reminded of the importance of verifying certification through ABSA's Directory before hiring any power engineer. If you find any discrepancy or have concerns with validity of a certificate of competency issued by ABSA, please provide ABSA with the details so that we may investigate and take appropriate follow-up action. ❖

Power Engineer's Certificate Cancelled

We reported, in the June, 2009 issue of the Pressure News, that an ABSA Safety Codes Officer found a high pressure steam boiler in operation with the safety valves removed. As provided in Section 42 of the Safety Codes Act, the Administrator cancelled the operator's power engineering Certificate of Competency. The Safety Codes officer had the boiler shut down and issued an Order to the owner. The boiler remained shut down until the owner demonstrated full compliance with the Order by ensuring the boiler was in safe operating condition and having competent operators. Having the boiler out of service also resulted in significant costs to the operation of the organization involved. ❖

Blowoff Vessels For Power Boilers

Blowoff vessels are sometimes improperly referred to as blow-down vessels and are commonly seen with boilers. In accordance with Clause 6.5 of CSA B51 Code, which is adopted by the Pressure Equipment Safety Regulation, a blowoff vessel is required when the blowoff from a power boiler is discharged into a sewer system The purpose of the blowoff vessel is to ensure the safety of personnel, during blow-down operations, and to lower the temperature of boiler effluent to below 140 degrees Fahrenheit prior to entering the sewer system.

The design requirements of blowoff vessels operated in Alberta are described in CSA B51 Clauses 7.5.1.1 through 7.5.1.6. Blowoff vessel design pressures are established in Table 2 which requires that, for up to 2060 kPa (300 psi) boiler pressure, the vessel design pressure must be at least 30% of the boiler pressure . For power boilers exceeding 2060 kPa (300 psi), the vessel design pressure will be at least 690 kPa (100 psi). Requirements for blowoff vessel diameter and volume are based on boiler evaporative capacity as per Table 3 in CSA B51.

If two or more power boilers blow down into the same blowoff vessel, then the blowoff vessel shall be designed for the boiler with the largest evaporative capacity. For example a power boiler with an evaporative capacity of 100,000 lbs /hr (45,400 kg/hr) is in common with a boiler with an evaporative capacity of 45,000 lbs/hr (20,454 kg/hr). The design volume ,and size, shall be for the unit with the larger evaporative capacity. In this case the minimum diameter and minimum volume shall be 48 inches and 60 cu. Ft (1.7 m3) respectively.

The above requirements describe conventional blowoff vessels. ABSA has accepted certain non-conventional blowoff vessels for use in Alberta in accordance with the provisions in CSA B51. Note (2) of Table 2 states that blow off vessels that are less than 18 inches in diameter for evaporative capacities less than 340 kg/h may be accepted by the "regulatory authority", where supported by "design analysis". This note describes unique "proprietary designs" that do not meet the diameter and volume requirements of CSA B51 standard. These blowoff vessels typically incorporate some type of control system – which by design will not allow boiler effluent to exceed 140 degrees F. These proprietary designs originated from the need to install blowoff vessels in operating areas which had space limitations. Each model is designed for a particular "range" of evaporative capacities, which should not be exceeded.

Even though these designs do not meet the diameter and volume requirements of CSA B51, they are still required to meet the remainder of the design criteria laid out in CSA B51. They must be equipped with a minimum 3 inch atmospheric vent, minimum ¾ inch cold water supply, and water discharge line of suitable capacity and size, to ensure that there is no appreciable rise in water level in the vessel.

Boiler owners and operators are reminded that all blowoff vessels should be "internally" inspected regularly during plant outages to ensure they are safe for continued service. For more specific and detailed information regarding the design and installation requirements, of these pressure vessels, please refer to Clause 7.5.1.1 of the CSA B51 Code. ❖

NEW ABSA SEMINAR READY TO GO

Dr. Ken Lau will conduct a seminar on Pressure Vessel Design in mid to late September at the ABSA office in Edmonton.

This seminar will address some of the engineering fundamentals for pressure vessel design. The seminar will examine the responsibility of respective parties and the scope and limitations, using the ASME Section VIII Div. 1 Code as an example. Subjects reviewed will include material selection, design factors and establishment of allowable stress values, opening reinforcement, flanges and other pressure vessel design considerations. The seminar will also address ASME Section VIII Div. 2 including the basis of the Division and its use in Alberta. The seminar will include a review of common problems and deficiencies to allow participants to gain a better understanding of pressure vessel technology.

The seminar will consist of a lecture supported by a slide presentation and reference study materials.

The cost is $460 per participant including lunch, refreshments and course materials. Watch the ABSA website for specific information about scheduling and registration in the near future. ❖

ABSA EDUCATION & TRAINING

Current Seminars

Annual Code Update Seminars (1 day)
The annual Code Update seminars are scheduled on October 5, 2010 in Nisku, AB and on October 7, 2010 in Calgary, AB. Please contact Cynthia Formaniuk (formaniuk@absa.ca) for further details and registration.

Pressure Piping Fabrication Requirements and Quality Control Seminar (2 days)
This seminar continues to be successful and in demand. The next public seminar is scheduled on September 22nd and 23rd, 2010.
ABSA is prepared to deliver this seminar in-house to organizations upon request. ABSA has received outstanding reviews for the 3 in-house seminars conducted to date this year.

Pressure Equipment Safety Legislation (PESL) Seminar (2 days)
This introductory seminar also continues to be in demand. The next public seminar is scheduled on September 8th and 9th, 2010.

Check the ABSA website (www.absa.ca) for the full schedule and descriptions of current public seminars.

Pressure Equipment Safety Regulation (PESR) Seminar (1 day)
This seminar provides an overview of Alberta requirements and programs for pressure equipment safety under the Alberta Pressure Equipment Safety Regulation (AR 49/2006) as well as a detailed presentation of the Pressure Equipment Safety Regulation of the with an emphasis on owners' responsibilities.
At this time, this seminar is only available by request for in-house delivery.

Seminars in Development

Pressure Equipment Safety Legislation (PESL) for Engineering and EPC Companies (1 day)
The BETA version of this seminar will be delivered to an EPC company in June 2010. ABSA is prepared to deliver customized versions of this seminar to engineering and EPC companies upon request. Watch the ABSA (www.absa.ca) website for a full description and future availability of this seminar.

Design Registration Seminar (Modular)
ABSA is developing a modular Design Registration seminar that addresses the design registration requirements for all types of pressure equipment. The modular design is intended to provide a flexible delivery of the seminar subject matter depending on the specific needs of the seminar audience. The launch of this seminar is tentatively targeted for the 4th quarter of 2010. Watch the ABSA website (www.absa.ca) for the full description and future availability of this seminar.

Quality Systems and Inspection for Pressure Equipment Construction Seminar (2 days), Pressure Relief Valve Seminar (2 days), and ***Pressure Vessel Design Seminar (1 day)***
All of these seminars are in development and targeted for initial delivery to the public in September or October 2010. Watch the ABSA website (www.absa.ca) for the full description and future availability of these seminars.

ABSA thanks all pressure equipment industry stakeholders for their continued support for our commitment to ***Safety through Education.*** We rely on and value the input, feedback and participation of industry to help us identify education and training needs and we are committed to responding to those needs. Please contact Michael Mace (mace@absa.ca) to discuss your specific training needs and to discuss arranging a customized or in-house seminar for your organization. ❖

ISO RECOGNITION OF CSA B51-09

It has been announced by CSA that the CSA B51-09 Code is recognized by International Standards Organization (ISO) as meeting the requirements of ISO Standard ISO-16528 Boilers and Pressure Vessels — Part 1: Performance requirements.

The application is now posted on the ISO TC 11 website along with other internationally recognized codes including the ASME, Australian and Japanese codes. This recognition by ISO will raise the profile of CSA B51 which is now presented as a viable standard for the construction and operation of boilers and pressure vessels. Also, the recognition of CSA B51 will potentially allow Canadian manufacturers of pressure equipment easier access to the international market. ❖

CUSHION TANKS FOR HEATING SYSTEMS

Many hot water heating systems include cushion tanks (pressure vessels) that were not constructed to CSA B51 Code. While this may be acceptable in some applications, misunderstanding, or lack of knowledge of the requirements can lead to potential unsafe installations. To ensure safety, owners need to be aware of the requirements for cushion tank.

CSA B51-09 *Boiler, pressure vessel and pressure piping code* is adopted as part of the Pressure Equipment Safety Regulation (Alberta Regulation 49/2006). CSA B51-09 defines Cushion Tank as "*a pressure vessel installed in a closed hot water heating system or cooling system to provide a pneumatic cushion for the expansion of water".*

CSA B51-09, clause 7.4.4 further provides that " *Cushion tanks having a working pressure exceeding 207 kPa (30 psi) or a diameter exceeding 610 mm (24 in) shall meet the requirements of Section VIII, Division 1, of the ASME Code. A cushion tank having a diameter of 610 mm (24 in) or less and a pressure of 207 kPa (30 psi) or less is not subject to the requirements of this Standard."*

The Pressure Equipment Exemption Order (Alberta Regulation 56/2006), section 2(2)(e) establishes an exemption from the Pressure Equipment Safety Regulation for:

(e) a pressure vessel that
- *(i) is installed in a closed hot water heating system,*
- *(ii) has a working pressure not exceeding 207 kilopascals, and*
- *(iii) has an internal diameter not exceeding 610 millimetres;*

This exemption permits the use of non-Code vessels providing these limits are met.

Vessels that exceed either of these limits must be designed and constructed in accordance with the requirements of the ASME Code.

To summarize, Owners need to evaluate that their systems are safe for operation. As part of that evaluation, owners must ascertain that the system requirements, including the working pressure and sizing of cushion tanks used in their closed systems, are in compliance with Code requirements. ❖

Impact Testing

We were advised of a recent case outside our jurisdiction when a vessel was completed with material which was impact tested as specified but, unfortunately, the welding was conducted to a Welding Procedure Specification that was not qualified with impacts as required by the ASME Code. Because of the material thickness, the Minimum Design Metal Temperature was well above ambient temperature and impact testing was required.

This is an excellent reminder to ensure that impact testing requirements of CSA B51 and the ASME Code are complied with, not only because of the potential cost and time delay in projects but also the possible hazards involved from operating pressure equipment that does not meet the impact requirements of the Code. ❖

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