ABSA
the pressure equipment safety authority

THE PRESSURE NEWS

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IN THIS ISSUE:

YEAR END MESSAGE

Once again, we are pleased to report that ABSA staff had a very safe year in terms of injuries to employees. From an industry perspective, there were fewer incidents and unsafe conditions reported in comparison with previous years. More importantly, there were no major pressure equipment accidents involving fatalities or serious injuries in Alberta this year that were caused by the failure of the pressure boundary.

As we look back on last year, it was a year of transitioning ABSA from being prepared to weather one of the most severe economic recessions in recent memory to one of preparing for the challenges of Alberta's growing economy. Vessel completions for the year were up 34% over last year; design registrations were up 13%; and seminar instruction hours were up 72%. Looking forward, this growth is expected to continue. Financially, ABSA's reserves at year end met the Board's targets for financial health. As a result of this fiscal discipline, ABSA's fees will remain unchanged for 2012. The last fee increase was in January 2009.

ABSA is now positioning itself to handle accelerated growth in Alberta. Efforts in this regard have been largely focused around inspections, training and design survey.

In addition to a knowledgeable and skilled staff, ABSA is very fortunate to have a dedicated and committed Board of Directors. In May, 2011, Tony Robinson was invited to join ABSA's Board of Directors. Mr. Robinson is the Operations Manager, Production and Processing at Enerflex Ltd. and brings his extensive knowledge of the pressure equipment manufacturing industry in Alberta to ABSA's Board. He joined John Ell, President of ATCO Power; Dave Rushford, Senior VP and Chief Operating Officer of Quicksilver Resources Canada Inc.; Dr. Gordon Nixon, Vice President Academic of SAIT Polytechnic; and Dale Myggland, Owner of BRIAS Inc. who is the Minister's Appointee. Tony replaced Don McFarlane as the Manufacturing sector representative on the Board. We would like to take this opportunity to thank Don for his significant contributions and valued leadership over 6 years.

With a strong balance sheet going forward and led by seasoned and committed staff, we are confident that ABSA is well positioned to manage the expected growth, deliver on its mandate and continue to provide effective leadership in pressure equipment safety.

As we come to the end of the year, the Board and all the staff at ABSA wish you all the best for the holiday season as you share it with family and friends. Our wish is that your new year will be safe and filled with happiness, joy, health and prosperity .

ABSA FEE SCHEDULE ANNOUNCEMENT

ABSA has reviewed the fees and charges as they relate to the powers, duties and functions delegated to us under the Boilers Delegated Administration Regulation and has determined that a fee increase is not necessary at this time.

Therefore, the fee schedule established in 2009 will remain in effect for another year, through 2012.

ABSA is a self-sustaining not-for-profit organization. We recover our costs through revenues generated by fees charged to customers and we place a high importance on ensuring value for cost. Fees are necessary to ensure the operational effectiveness of ABSA and we are committed to giving you our best effort with regard to the effective delivery of pressure equipment safety programs in Alberta. ❖

ASME Boiler and Pressure Vessel Code – Errata and Notices

ASME announces that there will be no addenda service in 2012 as well as for all future years.

A new edition of the Boiler and Pressure Vessel Code will be published in 2013 and from then on, a new edition of the Code will be published every two years.

"Errata" of the code and all special "Notices" with respect to the current edition of the ASME Boiler and Pressure Vessel Code will be announced through postings on the ASME website immediately after receiving approval from the respective ASME Boiler and Pressure Vessel Code Section Committees.

One can gain assess to the postings of these "Errata" and "Notices" through the "Boiler and Pressure Vessel Code Resources" page of the ASME Boiler and Pressure Vessel website (www.ASME.org). In addition, one can also subscribe to notifications to the Errata and Special Notices postings for each and every ASME Boiler and Pressure Vessel Code Section.

Link to the ASME Boiler and Pressure Vessel Code (BPVC) Resources page:
http://www.asme.org/kb/standards/bpvc-resources

Link to the Errata and Special Notices page and subscription to notifications:
http://cstools.asme.org/BPVErrataAndSpecialNotice.cfm

Since ASME no longer distributes the Errata as part of the ASME Code book, **all organizations who are required to maintain up-to-date ASME Code Section(s) under their quality systems are asked to ensure that they update the Code Section(s) following the Errata being issued by the ASME**. ❖

Pressure Relief Valve Failure on Air Compressor

A pressure relief valve (PRV) body failed during normal operation of a low volume, high pressure, skid mounted 3-stage air compressor unit used to fill portable self-contained air breathing bottles. Pressure switches are used to control the starting and stopping of the air compressor (starts at 4500 psi and stops at 4850 psi). Operators indicated the air compressor was in operation, and they estimated the system pressure was at approximately 4700 psi when the PRV broke off at the base (inlet end) of valve body. Fortunately, no injuries were reported.

Failure analysis indicated the PRV body failed as a result of a sudden one time brittle fracture event. It was assumed that a sudden pressure surge in the compressor discharge contributed to the failure. A significant finding was that the pressure relief valve had not been tested or serviced for approximately fifteen years, and that it did not have a name plate installed on it.

The pressure relief valve is the last line of defence for pressure equipment. It is therefore of utmost importance to maintain that in good working order.

As indicated in ABSA publication AB-506 *"Pressure Equipment Inspection and Servicing Requirements":*

(a) pressure relief valves in air service are to be manually tested (by operating the test lever) annually and at the time of the thorough inspection of the associated vessel;
(b) PRV's are to be replaced or serviced if there is any malfunction or leakage;
(c) If PRV's are serviced, the service company will affix a tag indicating the date it was serviced and confirmation of the set pressure; and
(d) If the PRV is replaced, the installer must confirm that
  (i) the replacement valve has the proper markings to indicate manufacturer, set pressure and capacities and
  (ii) the valve is of the appropriate size, set pressure and capacity. ❖

RESPONSIBILITY FOR NDE DURING PRESSURE VESSEL FABRICATION

Nondestructive examination (NDE) is used during construction of pressure vessels as a quality indicator of base materials and the fabrication processes (e.g., weldments, etc.,). The aim of NDE, be it radiography (RT), ultrasonic (UT), magnetic particle (MT) or other examinations, is to provide a reasonable assurance that the finished vessel may be operated with the margin of safety intended by the design factor.

The parties common to most pressure vessel construction are the owner, the manufacturer, the subcontracted NDE service provider and the authorized inspector (AI). Each has responsibilities for NDE that must be clearly understood by and among all parties concerned. This article identifies and provides a brief explanation of the key responsibilities of each party.

Owner's responsibilities

The owner is responsible for the safe operation of the vessel once it is in service. Service typically causes some deterioration of the pressure vessel over time, and some services are more severe than others. The owner needs to be fully cognizant of the service conditions the vessel will be exposed to, and may, in some circumstances, find it prudent to specify NDE that exceeds the requirements specified in the Code of construction. This may include specifying additional NDE with acceptance criteria established by the owner, or specifying defect acceptance criteria that is more restrictive than stated in the Code of construction.

It must also be recognized that NDE techniques are not all equal and some may be better suited for detecting certain/different flaws/inclusions/defects than others. Even with a single NDE technique (e.g., UT), there may be more than one methodology (e.g., TOFD and Phased Array) each more suitable than another for certain applications. However, in most Codes of construction, more than one technique (e.g., UT or RT) may be deemed as equally acceptable. When not specified by the owner, as far as a majority of construction codes and standards go, the choice of NDE would be left to the Manufacturer to decide. Thus, if the owner were to favour a certain NDE over another, for whatever reasons, the owner must clearly detail such provisions in the contract.

Manufacturer's responsibilities

Manufacturer's responsibilities are established by the Code of construction. For example, according to ASME Section VIII Division 1 paragraph UG-90(b), *"The Manufacturer has the responsibility of assuring that the quality control, the detailed examinations [i.e NDE] and the tests required by this Division are performed."* This broad statement means the Manufacturer is accountable for all aspects of NDE: that it is performed to the extent required and performed and interpreted by qualified personnel, that the results are acceptable, that unacceptable defects are remedied, and that the results are properly documented.

The Manufacturer's accountability for these responsibilities are not absolved when the NDE is performed by a subcontractor. The Manufacturer is responsible to review and accept the NDE subcontractor's written practices, which must use SNT-TC-1A or CP-189 as a guide, and to ensure that NDE personnel have been properly qualified and certified in accordance with this written practice. ASME Section V T-150 states that when NDE is required by the construction Code, it must be done to a written procedure. A procedure demonstration must be performed to the satisfaction of the Authorized Inspector. The Manufacturer must verify these demonstrations have been completed prior to allowing Code required NDE to be performed. This verification must be documented and included in the NDE subcontractor's NDE manual. The Manufacturer is also responsible to review and accept the results of the NDE performed, and to maintain records of the NDE, all in accordance with their quality management system.

The Manufacturer may have additional responsibilities established and agreed with the owner and documented in the purchase contract. It is noted these are additional contractual responsibilities over the minimum responsibilities as specified in the Code of construction that must always be met.

NDE Subcontractor's responsibilities

The NDE subcontractor's responsibilities are established by the contract, the details that are pertinent to this discussion would include requirements to the effect: NDE is to be performed in accordance with the requirements established in ASME Section V, and to the subcontractors *Written Practices* as well as specified in the code of construction. The NDE subcontractor's personnel are responsible to perform the NDE , to interpret and document the results, and to provide the results to the Manufacturer.

Authorized Inspector's Responsibilities

The AI's responsibilities are established in the Code of construction. For example, according to ASME Section VIII Division 1 Paragraph UG-90(c)(1)(i), the AI is responsible for "verifying that required nondestructive examinations, impact tests, and other tests have been performed and that the results are acceptable".

The AI fulfills this duty by verifying the NDE was performed and interpreted by qualified personnel and that it is documented properly. The AI is also responsible to witness demonstrations of NDE procedures for UT, MT, and PT when these non-destructive examinations are required by the construction Code.

(Continued on page 4)

(Continued from page 3)

In Alberta, to ensure uniformity across the Province, this witnessing is conducted on behalf of the AI's by the Authorized Inspector Supervisors (AIS), and the outcome is documented in the NDE subcontractor's documentation. Prior to witnessing the demonstration of the NDE procedures, the AIS will review the "Written Practice" and NDE procedures to ensure they meet the minimum requirements set out in the ASME Codes (e.g. addressing the essential and non-essential variables listed in the various Articles of ASME Code Section V). This review of written practices and NDE procedures is done to verify the procedure may be suitable for Code work and to confirm the demonstration is in accordance with the written practices and procedures.

The outcome of the procedure demonstration is typically documented in a letter issued by the NDE subcontractor which identifies the procedures demonstrated, and includes the names and signatures of the company representative and the AIS that witnessed the demonstration. A copy of this letter is usually kept in the NDE subcontractors manual and provides evidence to the Manufacturer that the NDE subcontractor's procedures were demonstrated to the AI. It does not satisfy the Manufacturer's Code responsibility to review and accept the written practices of the NDE subcontractor.

It is good to note that generally, NDE, as performed in Alberta, has always been well regarded helping greatly to promote pressure equipment safety in our province. As stated in the introduction, this article provides only a brief explanation of key responsibilities. With this article, everyone involved with NDE may get a basic understanding of others' responsibilities. But it is important that one should have a thorough understanding of one's own responsibilities not only for the sake of public safety but also one's legal accountability and liability as well. All parties need to work together with respect to NDE as well as other aspects of pressure equipment construction to ensure the integrity of the pressure equipment when it leaves the Manufacturer's control. ❖

HEATING BOILERS SAFETY

Heating boiler systems, with the use of heating boilers, transfer the energy produced from burning a fuel, usually natural gas here in Alberta, via water or steam to the space (e.g., apartments, stores, warehouses, schools, hospitals, …. etc) to be heated. Safe operation of heating boilers requires several layers of protection to control the energy transfer process and to provide additional safeguard should the controls fail. This article provides an introduction to the three basic levels of safety protection required for boiler operation.

There are two types of heating boilers;

1. Hot Water which operates under 1103 kPa pressure and below 121ºC temperature (160 psi / 250ºF); and
2. (Low Pressure) Steam which operates below 103 kPa (15 psi).

It is important to know that each type of boiler operates on two slightly different strategies to get heat to where you need the heat.

- ◊ Hot Water Heating Boilers respond to the TEMPERATURE of the hot water leaving the boiler.
- ◊ Steam Heating Boilers respond to the PRESSURE of the steam leaving the boiler.

The protective devices of these boilers all function in much the same way.

The three different basic levels of safety protection may be described as follows:

Level One: Both types of boilers have a main 'modulating' controller. If the steam boiler pressure drops, or the water temperature in the water boiler drops, the modulator detects the drop and directs the boiler's burner to start and run, producing heat which transfers into the boiler increasing the steam pressure or the water temperature until the modulator is satisfied. Once the modulator is satisfied, it cancels the signal to the burner which stops combustion. The cycle repeats as needed.

Level Two: If the modulating controller malfunctions and the burner does not shut down, it is possible that the system may be over pressurized or over heated (which will then result in over pressurization). For this purpose, a 'High Limit' controller ('trip') is also installed on the boiler. This high limit trip, will protect the boiler from overheating and failure, by shutting the burner down when its set point is reached. It is set at slightly higher pressure or temperature than the upper set point of the modulating controller. The 'High Limit' trips (shutdown) the burner and will not allow the burner to restart automatically by the modulator. An competent person MUST come and check the boiler for a problem and then, the 'High Limit' trip can be manually reset, and the operation cycle may continue. It should, however, be watched for a number of cycles to ensure the issue resulting in the trip in the first place is resolved.

Level Three: The last level of protection is the Pressure Relief Device. In the event that <u>both</u> the Modulator AND the High Limit devices should fail, and the system pressure increases to the extreme upper limit (called the maximum allowable working pressure), engineered pressure relief devices (often called Safety Valves, Safety Relief Valves) installed on the boiler are designed to open and release all the pressure that the heating boiler can produce under full burner firing load.

All the devices in all the three levels of safety protection require maintenance and servicing to ensure that they are in good working order. Obviously, only an experienced professional should ever perform servicing and maintenance on your Heating Boiler. It is highly recommended that, prior to each heating season, you have a reputable and experienced company checking ALL three levels of safety protection designed into your heating boiler system for the safety of yourself, your family, your tenants, your workers, as well as your building and contents. ❖

FITNESS-FOR-SERVICE EVALUATIONS

ABSA document AB-506, Section 14, discusses the use of fitness-for-service evaluations. It references Recommended Practice API-579 for coverage of fitness-for-service assessment procedures for evaluating commonly encountered flaws, including general and widespread corrosion and pitting, blisters, crack-like flaws, etc. API 510 and NB-23 are also referenced covering some basic information for assessing local thin areas and pits.

While it may be appropriate to use these referenced documents as a basis to evaluate fitness for service, pressure equipment owners have to be aware that whenever the minimum design conditions of the original code of construction would no longer be met, and if it is intended to use the vessel without repairing it, all such proposals must be submitted to ABSA Design Survey for review and acceptance.

Notwithstanding the above, the criteria for accepting pits in accordance with API-510 and NBIC may be used, without submitting the proposal to ABSA, provided the pit assessment is carried out by a competent and certified inspector working under their employer's owner/user or inspection company Certificate of Authorization Permit. ❖

EXTERNAL TRAINING NEWS

Repair and Alteration

We have launched our first *"Repair & Alteration"* seminar to the public at the end of October, 2011. This seminar was well received by the 25 attendees with positive feedback given to the presenters with suggestions in how to improve the seminar even more. This seminar provides the students with a thorough understanding of the regulatory requirements on repair and alteration of pressure equipment including the AB-513 document (Pressure Equipment Repair and Alteration Requirements) along with gaining skills in the development of a "Repair Plan". Participants will also learn why a "Root Cause Analysis" is important in a repair plan and the roles and responsibilities of the "Owner", "Inspection Company", "Competent Personnel" and "Inspector". We encourage all who are interested in this seminar to book early for the 2012 sittings.

Regulatory Information for Power Engineers

Are you a Power Engineer? Are you involved in teaching power engineers? Are you involved in the operation of power plants, heating plants or thermal liquid heating systems?

If you are, then you will be pleased to know that starting this January 2012, a new seminar will be launched entitled "Regulatory Information for Power Engineers". This seminar is designed to broaden one's knowledge in the legislative requirements for all who are involved in heating and power plants including the educators and trainers of operation personnel and those who own, operate, maintain and repair pressure equipment described in the Power Engineers Regulation.

Who should attend?

The target audience for this seminar includes those who work in the operation of power plants, heating plants, and thermal liquid heating system facilities, and education institutions who teach power engineering including :

- ◊ chief power engineers
- ◊ shift operators
- ◊ power engineering instructors
- ◊ shift engineers
- ◊ owners

What will you learn

The candidates can expect to acquire basic information about:

- ◊ *ABSA's role under the Safety Codes Act & regulations*
- ◊ *Power Engineers Regulation*
- ◊ *Pressure Welders Regulation*
- ◊ *Power Engineer's Responsibilities*
- ◊ *Supervision Requirements*
- ◊ *Safety Codes Act*
- ◊ *Pressure Equipment Safety Regulation*
- ◊ *Owner's Responsibilities*
- ◊ *Power Engineering Certification Process*
- ◊ *Qualification for Power Engineer Examinations*

A full listing of upcoming seminars and schedules is posted on our website at www.absa.ca under seminars. ❖

POWER ENGINEERING STUDENTS WORKING OUTSIDE OF ALBERTA

Power engineering candidates working outside of Alberta to gain experience for certification in Alberta must meet the other jurisdiction's requirements for working as a power engineer. This will usually mean obtaining a certificate or license from that jurisdiction before starting work.

At the end of the work term, in order to have the work experience recognized as part of the certification application in Alberta, the candidate must submit a completed ABSA Form AB-130 with all supporting documentation. ABSA will in turn, request confirmation from the jurisdiction before the experience is accepted. The other jurisdiction will not be able to confirm the experience if the candidate is not properly qualified to work in that jurisdiction. ❖

POWER ENGINEERING EXAMINATIONS

Retirement of the 2004 Edition of the ASME Academic Extracts

As announced on July 1, 2010, the 2004 edition of the ASME Academic Extracts and Supplement will be retired on January 1, 2012.

Starting January 1, 2012, examination candidates should be using either the 2007 edition of the ASME Academic Extract and Supplement or the current edition of the ASME Codes when writing the SOPEEC examinations. A candidate who uses earlier editions of the ASME Codes or Extracts, does so at the risk that the information could be outdated and may not provide the correct answers.

No Examination Questions on the New Corrosion Topic for the 2nd Class Part A Paper 2

As announced in January 2011, the new corrosion topic for the 2nd Class Part A Paper 2 became effective on July 1, 2011 and may be examined starting January 1, 2012.

Because the course material for the new corrosion topic has not yet been published, there will be no examination questions on this topic until January 1, 2013. ❖

ABSA BOARD OF DIRECTORS

ABSA is looking for a person to fill an upcoming position on our Board of Directors.

The vacancy is for a member to represent the oil and gas sector and as such the successful candidate, in addition to working with the other board members to provide good governance to ABSA, will also bring personal insight to the Board regarding pressure equipment safety and the oil and gas sector.

ABSA Board members serve a three-year term with the option to serve an additional three-year term. This term would begin July 1st, 2012.

For more information on this position please consult our website at http://www.absa.ca/ABSA-Info/Career.aspx. You can also contact Jared Uditsky, Human Resources Manager by email: hr@absa.ca.

Closing date for applications for the above position is January 15th, 2012. ❖

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