ABSA
the pressure equipment safety authority

THE PRESSURE NEWS

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EQUIPMENT FABRICATION MUST ALWAYS START WITH A CODE COMPLIANT DESIGN

During an ASME investigation into allegations concerning the fabrication and delivery of a possible non-compliant piece of equipment by an overseas Manufacturer holding ASME Code Stamp authorization, ABSA was approached by the ASME for further details.

ABSA's investigation indicated that:

- The design was submitted to ABSA for registration May 2011;
- The design review revealed several Code non-compliant deficiencies which were communicated to the manufacturer;
- After several attempts to have the fabricator's addressing the issues raised and due to the lack of response, the registration was rejected and the submission closed late February 2012;
- ABSA's Field Inspection Safety Codes Officer visited the alleged location of installation for this equipment during May 2012, and found that:
  1) the equipment was not in service, but deposited at site;
  2) the equipment was placed in service for an unconfirmed period of time, even though the equipment was not in compliance with the Regulations;
  3) the manufacturer's Data Report U-1 form did not show a CRN number;
  4) the equipment had an ASME Code nameplate and a National Board registered U-1 form.

On receipt of information from ABSA, an on-site audit of the Manufacturer was conducted by ASME confirming the deficiencies reported. As a result, corrective actions were taken for the non-conformances including removal of the nameplate and other ASME Code marking from the equipment and additional training of the Manufacturer's engineering staff.

In Alberta, in addition to the removal of the equipment and the removal of the nameplate and other Code markings, the equipment Owner was issued with a Corrective Action Report with respect to placing in service non-compliant equipment.

We are using this incident to remind everybody involved with pressure equipment that the design, fabrication and installation of pressure equipment in Alberta must be in full compliance with the Safety Codes Act and the Pressure Safety Equipment Regulation. To do otherwise not only would be in violation of the legislation, but worse, could seriously jeopardize public safety. The presented case represents an offence under the Section 67 of the Act and the offender is liable under Section 68 of the Act for a fine, imprisonment, or both.

ABSA will endeavour to work and co-operate with designers, manufacturers, owners and all concerned to ensure that only safe and compliant equipment is placed in service in Alberta. ❖

ABSA CODE UPDATE (ACU) SEMINAR

The annual Code Update seminar will be held in Nisku and Calgary on September 20th and 26th, 2012 and is currently full. We have set an additional day for this special seminar on October 02, 2012. This seminar will be held at our office in Edmonton or at a hotel in Nisku, depending on the number registered. Please visit our website to register for this seminar at www.absa.ca. ❖

ALBERTA "PROVINCIAL" POWER ENGINEER CERTIFICATE

Effective August 1, 2012, an Alberta Provincial Power Engineer Certificate will have a new rectangular "Alberta Provincial Certificate" stamp while an Alberta SOPEEC Power Engineer Standardized Certificate continues to have a circular "SOPEEC" stamp. There is no difference between the scope of practice permitted by the Alberta SOPEEC Power Engineer Certificate and the Alberta Provincial Certificate for the same class of certification.

Alberta issues both Standardized SOPEEC Power Engineer Certificates of Competency as well as Provincial Power Engineer Certificates of Competency. SOPEEC Certificates are issued when an applicant meets all the certification requirements and has passed all SOPEEC examinations for that class of certification.

For an applicant who meets all the certification requirements based on equivalent qualification but without passing all SOPEEC examinations, an Alberta Provincial Certificate will be issued. Typical equivalent qualification is provincial certificate issued by another Canadian jurisdiction under the Agreement on Internal Trade (AIT) arrangement and marine engineers.

Under the Agreement on Internal Trade (AIT), which became effective on April 1, 2009, "*workers in regulated occupations can apply to be certified in the same occupation in another province or territory without having to undergo significant additional training, examination or assessment. Individuals are still required to apply to jurisdictional regulators for certification in their occupation*". Since April 1, 2009, under the AIT arrangement, the number of Alberta Provincial Power Engineer Certificates issued has increased.

It must be stressed that while certification is one of many components of a competent worker, under the Pressure Equipment Safety Regulation, owners are responsible to ensure that their operators are competent to operate pressure equipment. ❖

STANDARDIZATION OF POWER ENGINEER CERTIFICATION ACROSS CANADA

Work is proceeding, nationally, on developing standardized certification requirements for power engineers. Canada currently has a standardized examination system for power engineers. Following a request from the National Public Safety Advisory Committee (NPSAC), the Association of Chief Inspectors (ACI) asked SOPEEC to develop standardized requirements for sizing of plants and establishing supervision requirements. Once requirements are established and approved by ACI, they will be submitted to NPSAC and it will be up to each jurisdiction to decide when to include those requirements in their legislation.

The following is a discussion on standardization that is already in place and the different partners working towards that goal across Canada.

The Standardization of Power Engineer Examinations Committee (**SOPEEC**) is a committee delegated by, and responsible to, the Canadian Association of Chief Inspectors (**ACI**). SOPEEC was started in 1972 to promote a uniform examination system and improve mobility of power engineers between member jurisdictions. SOPEEC is a national committee representing all Canadian jurisdictions. The committee consists of one representative from each jurisdiction.

The ACI owns all SOPEEC examination materials and SOPEEC maintains the examination banks for power engineering certification and promotes the utilization of a uniform national standard. SOPEEC's areas of responsibility include: standardized examination content, development of examination syllabi, and interprovincial power engineering certification. SOPEEC also strives for standardization of power engineering regulations throughout Canada. SOPEEC makes recommendations, regarding qualification, examination and certification of power engineers, to the ACI which in turn considers and decides on direction.

SOPEEC meets annually in conjunction with the Interprovincial Power Engineering Curriculum Committee (IPECC) which represents educators and industry from across Canada. The two committees work together to enhance the power engineering program throughout Canada. The work includes: power engineering program and course curriculum development, development of examination syllabi and development of recommended reading material.

IPECC started in 1973. IPECC worked with SOPEEC in the initial development of the standardized examination system and has continued to review the system and provide recommendations on improvements and updates to the syllabi and course content It is important to continue to work to ensure that the programs continue to evolve to meet the safe operation requirements of today and tomorrow. The work of IPECC is important in ensuring that the requirements meet the needs of industry and continue to provide for safety in operation of pressure equipment. It is also important that industry has strong participation to ensure that the programs continue to meet their needs. Each jurisdiction can have two voting members at the annual IPECC meeting.

In Alberta, APECC (Alberta Power Engineering Curriculum Committee) nominates one educator and one industry representative to represent Alberta at the IPECC meeting. APECC represents Alberta industry and educators regarding power engineering certification. ❖

Potential of Carbonated Beverage Systems to Create a Life Threatening Environment

A Safety Alert (http://www.absa.ca/IBIndex/IB12-006.pdf) was issued on June 21, 2012 to raise awareness of a concern about beverage dispensing systems using carbon dioxide gas.

Carbon dioxide gas (CO2) is heavier than air, and when leaked into a confined, enclosed or poorly ventilated space, the gas has the potential to cause serious or possibly fatal situations. Owners/users of systems using carbon dioxide gas are cautioned that leakage into occupied spaces can result in the displacement of oxygen in the air, resulting in lower oxygen concentrations for breathing, which can lead to serious injury or death.

There are reports from other Jurisdictions that carbonated beverage systems have accidentally caused serious harm and even fatality to persons exposed to the gas due to leakage from the systems. ❖

Pressure Equipment Repair and alteration Requirements

With Information Bulletin IB11-006 issued June 21, 2011, the Administrator for pressure equipment safety established that repair and alteration of pressure equipment in Alberta must meet with the provisions of ABSA Document AB-513 (hereunder referred to as AB-513), *Pressure Equipment Repair and Alteration Requirements*, Edition 2 Issued June 21, 2011.

A phasing-in period is provided to allow organizations that hold quality management system certificates of authorization time to update their quality management system manual to conform to the requirements of AB-513.

As of June 30, 2012, all certificate of authorization permit holders involved with repair and alteration work must have their quality management systems updated to conform with the requirements of AB-513. ❖

AB-524 Pressure Relief Devices Requirements

On August 14, 2012, IB12-011 “Pressure Relief Devices Requirements” was issued by the Administrator for pressure equipment safety. The Information Bulletin clarifies that, as provided for under the Pressure Equipment Safety Regulation, to obtain a Certificate of Authorization Permit to undertake activities related to pressure relief devices, the provisions of ABSA document AB-524 must be met.

The AB-524 document reaffirms with updates existing policy and practices for manufacturing, assembling, selection & sizing, inspections, repairs, servicing, setting & sealing and installation of pressure relief devices. The document also provides information to assist service organizations in developing a practical and effective quality management system (QMS). A copy of the AB-524 document may be downloaded from ABSA’s website at www.absa.ca (search for “AB-524”).

The requirements and implementation guidance provided by the AB-524 document are intended to enhance the servicing standards by helping the industry meet the requirements of the design, construction and in-service inspection codes and standards, and therefore ensure that serviced Pressure Relief Devices are placed back in service in an as new condition.

Compliance with the AB-524 will be mandatory as of January 1, 2014.

Organizations holding a quality management system Certificate of Authorization permit to construct, manufacture, repair, alter, service, repair, set or seal pressure relief devices are asked to review their quality management system documentation to ensure the requirements will be addressed.

Owners of pressure equipment who have registered their pressure equipment integrity management (PEIM) system with ABSA are asked to review their PEIM system documentation and ensure that any requirements which are in addition to the AB-512 O/U Integrity Management Requirements document, are addressed. Completion of the AB-524b form Manual Review Checklist will not be required in that case and compliance to the AB-524 document will be confirmed by ABSA during the next PEIM certification renewal audit after January 1, 2014.

If you have any questions, please do not hesitate to contact Satwant Rakhra at 780-433-0281, ext. 3366, or at rakhra@absa.ca or your area Safety Codes Officer. ❖

CAUTION - REFRIGERANT REPLACEMENT AND PIPING SYSTEMS

Refrigerants in some older refrigeration systems are being replaced with “ozone friendly” products due to environmental concerns about refrigerant leakage causing ozone depletion. In some cases, based on the characteristics of the replacement refrigerant selected, this may result in the need to replace parts of the refrigerant piping system with tubing and fittings having a higher pressure rating.

Owners and service companies involved in this type of work must be aware of the need to have the system reviewed properly to determine the suitability of existing refrigeration piping for the replacement refrigerant. Failure to do so may result in equipment breakdown but worse, jeopardize public safety as well. ❖

REGISTRATION AND CONSTRUCTION OF PRESSURE FITTINGS

Table 1 of the Canadian Standards Association CSA B-51-09 Boiler Pressure Vessel and Pressure Piping Code classifies pressure fittings into the following different categories:

- *Category "A” fittings are piping fittings which include couplings , tees, elbows, wyes, plugs, unions, nipples pipe caps and reducers;*
- *Category “B” fittings are for all flanges;*
- *Category “C” for all line valves;*
- *Category “D” for all expansion joints and hose assemblies;*
- *Category “E” for Strainers, Filters, Separators and Steam Traps;*
- *Category “F” for Measuring Devices, including pressure gauges, level gauges, sight glasses, levels, and pressure transmitters;*
- *Category “G” for Certified capacity-rated pressure-relief devices acceptable as primary overpressure protection on boilers, pressure vessels and pressure piping, and fusible plugs; and*
- *Category “H” for Pressure-retaining components that do not fall into Category “A” to “G”.*

Clause 4.2.1 of the CSA B51 Code describes the requirements for registration of fittings. Moreover, Section 14 of the Pressure Equipment Safety Regulation (PESR) under the Safety Codes Act states that *"No person shall construct, manufacture or import for use in Alberta any pressure equipment unless the design of that pressure equipment is registered..."* and Section 11 of the PESR states that *"A person shall not construct or manufacture pressure equipment unless the person holds a Certificate of Authorization"*. ❖

CSA B52 PRESSURE TESTING REQUIREMENTS FOR REFRIGERATION PIPING

“We pneumatically test our refrigeration pressure piping to 110% of the design pressure, per ASME B31.5 requirements. What other pressure testing requirements are there?”

This question has arisen lately from some refrigeration piping manufacturers in relation to required pressure tests for refrigeration piping designed and constructed to ASME B31.5. Though necessary for field erected systems, a common pneumatic test alone of only 110% is often insufficient for refrigeration piping systems.

CSA B52 requirements for pressure testing are more stringent than those of ASME B31.5. For shop manufactured spools of refrigeration pressure piping, Clause 5.10.3.3 of CSA B52 requires pressure testing to 125% of design pressure, which is significantly more than the 110% required by B31.5 for field erected systems. Refrigeration pressure piping systems erected in the field need to be tested to 110% of design pressure after the completion of construction.

Pressure piping systems with an aggregate volume of more than $0.5m^3$ require registration. For shop manufactured piping spools that are part of these systems, documentation which confirms that shop testing will be done to 125% of design pressure needs to be included with the design registration application. For pressure piping systems with an aggregate volume not greater than $0.5m^3$, registration is not required, but the owner and the manufacturer still need to ensure full compliance of all requirements of CSA B52 and the code of construction. In other words, regardless of volume, refrigeration piping spools manufactured in the shop must always be pressure tested to 125% of design pressure.

In some cases, project specific pneumatic testing procedures may require registration even though the related pressure piping system does not. If vessels connected to the system cannot be isolated from the test, then their volume needs to be included in the test volume. Test energies associated with test volumes and pressures must be carefully compared with the standard test procedure energy limit, as specified in ABSA document AB-522. If a proposed pneumatic test exceeds that energy limit, then project specific pneumatic testing procedures registration will be necessary before conducting the test. ❖

Cast Iron and Cast Aluminum Section Boilers Assembly and Installation

It is a regular occurrence for cast iron and cast aluminum boilers to be fabricated at a manufacturer's out of province facility and then assembled on-site for installation in Alberta.

An ABSA Safety Codes Officer (SCO) was recently contacted by a boiler contractor regarding leakage that had occurred on several cast iron sectional water/glycol heating boilers installed at a large condominium complex. ABSA had not been notified of the boiler installation by the original contractor and thus, the boilers had not been inspected nor registered.

Upon inspection, it was found on four of the six boilers, the push nipples (gaskets) which accommodate assembly of the sections were misaligned and the bottom of two rear sections contained hairline cracks. The boiler manufacturer recommends that the sections are assembled by guiding them over a smooth steel plate laid on the floor and there was no evidence of this having been the case for the original assembly.

Assembly and installation recommended procedures can be found in the manufacturer's manual and should be followed.

After assembly of this type of boiler on-site, and prior to the boiler being put into operation, a hydrostatic pressure test of the boiler witnessed by an ABSA SCO is required. If the test is successful, the boiler would be stamped with an Alberta number if Alberta registration is required.

Steam heating boilers require a hydrostatic test to 310 kilopascals (45psi) and hot water heating boilers to150% maximum allowable working pressure. The AB-8 *"Installation Report for ASME Section IV Cast Iron and Cast Aluminum Sectional Boilers"* is to be completed by the boiler contractor after the hydrostatic test is satisfactorily carried out.

Please note that, in accordance with the code of construction, cast aluminum boilers can only be used in hot water service.

All heating boilers are required to be operated in accordance with ASME Section VI Recommended Rules for the Care and Operation of Heating Boilers. ❖

Unexpected Fire in Pressure Vessel

A gas processing plant had an unexpected fire in a sweet gas glycol separator.

The vessel was out of service, depressurized, isolated from the line with blinds, and purged for inspections and maintenance. A day after the vessel was out of service, operations noticed the temperature rising by the alarm in the control room. The operator in the field also noticed smoke rising from the top manway. Water was sprayed into the vessel through the manway and the smoke dissipated. Investigation revealed that the sweet gas glycol separator had a coalescing filter that was saturated with a pyrophoric material. When the pyrophoric material dried out exposing it to the atmosphere, it auto ignited.

During the original work planning, the glycol separator was considered as a routine activity in a sweet gas plant. There was no identified prior experience or exposures to pyrophoric material in previous inspections and normal operations.

Learning outcomes of the above incident are:

- Conduct Process Hazard Analysis on each plant. Until such analysis is completed, assume pyrophoric material may be present and ensure this is reflected within the Permit to Work, Hazard Assessments, and Operating Procedures.
- Conduct a review of Operating Procedures and ensure pyrophoric materials are identified as a hazard on the identified systems and ensure controls are in place.
- Develop a structured risk management process and a consistent method for assessing the likelihood of potential operating risk events as well as the health, safety and environmental impacts of such events. This would help ensure a common approach to the prioritization and management of identified risks in the plant. Ensure risks are recorded and assessed consistently and reviewed at least yearly by management. ❖

EXTERNAL TRAINING NEWS

Online Design Registration Seminar

ABSA has been working on the development of eLearning training for the Design Registration seminar for about a year. We are pleased to advise that the first part of this course, "Introduction to Design Registration", will be available before the end of this year.

This seminar will be presented in five modules and the first module will be a prerequisite before taking any of the other modules. The five modules are:

1 "*Introduction to Design Registration*" (prerequisite). After completing this introduction, one may take one of more of the other modules in any sequence.
2 *"Pressure Piping Design Registration";*
3 "Boilers and Pressure Vessels Design Registration";
4 "Pressure Fittings Design Registration"; or
5 "Repairs and Alterations Design Registration".

The benefits of this new eLearning tool include:

- People anywhere in the world may gain access to training on the registration process;
- Enhanced visual overview of the learning;
- Saving of time and money allowing both our clients and ABSA to be more efficient in the design registration processes;
- Immediate enrolment for a person in the training, not having to wait for the next scheduled course.

Pressure Vessel Design Seminar

Dr. Ken Lau will be the lead instructor for the seminar "Pressure Vessel Design" and this seminar will only be held once in the 2012 calendar year. You are encourage to take advantage of this opportunity to register for the November 14, 2012 learning event, to be held in Edmonton. This seminar will cover the following:

- Some of the engineering fundamentals for pressure vessel design;
- Responsibilities of respective parties (using the scope and limitations of 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;
- A brief discussion of the basis of the ASME Section VIII Div. 2 and its use in Alberta;
- A review of common problems and deficiencies to allow participants to gain a better understanding of pressure vessel technology;

ASME Section VIII and other codes and standards will be used as examples when some of these topic areas are reviewed. It should be noted that this is not a seminar on design codes and standards and not a seminar on the ASME Section VIII Code. ❖

NATIONAL 4TH CLASS POWER ENGINEERING TOP STUDENT AWARD

At this years annual Interprovincial Power Engineering Curriculum Committee (IPECC) and the Standardization of Power Engineer Examinations Committee (SOPEEC) meetings held in June, an Alberta 4th Class Power Engineering student won the top power engineering student award from PanGlobal Training Systems Ltd.

Mr. Claude Harty, from Keyano College in Fort McMurray, obtained the highest combined college mark and SOPEEC examination mark average of 92.85% in Canada for last year. The award was presented to Mr. Harty by Mr. Bob Clarke, Chief Operating Officer of PanGlobal. This was the sixth time in the last seven years that an Alberta student obtained an award. It is good to see that Alberta power engineering students continue to excel. ❖

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