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## VARIANCE FOR THE USE OF THE NEW (2007) ASME SECTION VIII, DIVISION 2 IN ALBERTA

The ASME Boiler and Pressure Vessel Code Section VIII Division 2 has been revised significantly with the publication of the 2007 edition of Code. A Variance has been issued by the Administrator to allow the use of the new Code (see Information Bulletin IB07-007 provided additional provisions are met.

The publication of this new Code is the result of a multi-year effort on the part of the ASME to develop "a new world-class design code taking into consideration the latest developments in materials, design, fabrication and inspection technologies". A taskforce of the Boilers and Pressure Vessels Technical Council of the Safety Codes Council was formed. The task force was charged to review if and how the new Code may be used in Alberta allowing the use of the latest pressure technology embodied in the Code while providing the same level or better level of pressure equipment safety in comparison with the use of the existing ASME Section VIII Division 2 Code which is a standard adopted as part of the *Pressure Equipment Safety Regulation*.

Following more than a year of review, the taskforce submitted a report which was accepted by the Technical Council on June 8, 2007. The Variance is issued with provisions in line with the recommendations of the taskforce report which is posted on the ABSA web-site as "<http://www.absa.ca/IBIndex/2007-06-08-BpvtcTaskforceReport.pdf>".

Anyone who is interested in making use of the new Code for the construction of pressure vessels for use in Alberta should review the Variance carefully and ensure that all the conditions stated therein are complied with. A copy of the Variance is available on the ABSA website under "<http://www.absa.ca/IBIndex/IB07-007.pdf>".

ABSA is planning to conduct a 1-day public seminar on the new Code as well as the provisions of the Variance for the use of the Code in Alberta. The seminar is planned to take place late November or early December with one session to be conducted in Calgary and another one in Edmonton. Please watch [www.absa.ca](http://www.absa.ca) for an announcement on the information seminars. ❖

## WARNING - WATER HAMMER HAZARDS

Recently, a 24" diameter above-ground steam line ruptured. Initial investigation indicated that "condensate induced steam hammer" could be the likely cause resulting in approximately 1.6 kilometres of the 4 kilometres line came off its support. The failure caused pieces of the line to travel in excess of 400 feet in all directions yet fortunately, no one was nearby when that happened. Although incident is outside the jurisdiction of the Safety Codes Act, ABSA, on request of the regulatory authority concerned, is assisting in the accident investigation.

Two pressure equipment accidents attributed to water hammer occurred earlier this year and were investigated by ABSA under the Safety Codes Act.

In one case, the main steam piping and the associated structural steel in an oil sands facility were damaged. The incident occurred during start up of a boiler following a problem with high level of water in the high pressure steam separator. The incident is still under investigation at this point of time and the cost is yet to be established.

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In another case, in a process plant, an accident occurred when steam was introduced into a header which had water in it. Water hammer developed, resulting in the rupture of the blowdown line with a shift of the header's location and the deformation of the associated 8" laterals. In this particular incident, it was concluded that the operators had not followed the written start-up procedures. The damage caused in this case was estimated to be over \$1 million.

It is worth noting that an incident occurred with a high pressure steam line releasing steam and water in an uncontrolled manner was reported previously in the Pressure News of December 2003. Again, fortunately no one was hurt and the damage was less than \$200,000.00.

Irrespective of the financial costs, we have been extremely lucky that, in all these incidents, no injuries or fatalities occurred. However, the consequences could easily have involved a heavy human toll. Industry must take note and take all necessary precautions to ensure similar incidents will not occur in their facilities.

Water hammer occurs primarily because water (condensed steam) collects in a low point of the steam line. On reintroduction of the steam to the line, the flow of steam over the pooled water creates turbulence that rapidly increases until the liquid water temporarily blocks the pipe. At this point, the steam pushes this slug of condensate along the line at the velocity of the steam.

When this slug of water encounters an obstruction or change in direction, it slams into that obstruction or elbow with great force, hence the name water hammer.

Designers and owners of steam systems must take all necessary steps to eliminate the hazard of water hammer including the following for introducing steam into a cooled line:

1. Low-point drains should be provided and these drains should be opened and kept open until dry steam is blowing out;
2. Ensure that steam traps are in good working condition;
3. Support horizontal steam lines to avoid sagging, where water could collect;
4. Gradually warm up the steam line; and
5. Never leave the line unattended until it is up to pressure and temperature. ❖

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## FUEL GAS REGULATOR VENTED INSIDE BUILDING

Recently an accident occurred in a gas processing plant and it was determined that it was caused by a faulty gas regulator. The regulator was installed erroneously to vent inside a separator building. Due to a problem with the diaphragm of the regulator, gas was vented inside the building. A flash fire occurred when an operator opened the door. The operator suffered burns.

In general, the basic requirements for gas relieved by pressure control devices are provided by the CAN/CSA-B149.1-05 Natural Gas and Propane Installation Code.

Proper care must be taken in installing the regulators and gas relieved must be safely vented to the outdoors to prevent accumulation of dangerous concentrations of gas indoors. Vent lines must be constructed of the same piping or tubing materials required for the supply of gas.

The outdoor vent termination of regulator and line relief devices must be equipped with a means to prevent the entry of water, insects, or foreign material. An example being that regulator should be installed with the vent pipe facing down and under a protective cover as freezing rain, ice, snow, mud or debris can obstruct the vent

In all cases, manufacturer's guidelines, including the sizing of the vent lines, must be strictly followed. For further information on fuel gas applications, please contact:

Alberta Plumbing and Gas Safety Services  
16<sup>th</sup> floor Commerce place, 10155-102 street, Edmonton, AB, T5J 4L4  
Tel: 780-644-1010 / Fax 780-427-8686  
Email: [safety.services@gov.ab.ca](mailto:safety.services@gov.ab.ca)  
Website: [www.municipalaffairs.gov.ab.ca/ss\\_index.htm](http://www.municipalaffairs.gov.ab.ca/ss_index.htm) ❖

## D I R E C T I V E

### Allowance for and Report of Local Thin Areas (LTA's) in Pressure Vessel Shells

A Directive has been issued by the Administrator to clarify and reaffirm the Alberta requirements for the acceptance of Local Thin Areas (LTA's). LTA's are generally filled with weld-metal build-up during the fabrication of a vessel, but are sometimes accidentally generated after hydrostatic testing or postweld heat treatment and could be impractical to fill with weld metal at such a stage of fabrication.

For LTA's to be accepted in any pressure vessel shell, the ultimate owner of the vessel must be advised of, and agree to accept, the vessel that contains one or more LTA's. It is the responsibility of the vessel manufacturer or seller, as the case may be, to advise the purchaser of the vessel.

The location, depth and outline of the LTA's must be provided to the ultimate owner of the vessel and information of the LTA's must be added to an as-built drawing for submission to ABSA as well as being accurately described under Remarks on the Manufacturer's Data Report for the vessel or included as a Supplemental Sheet to the Manufacturer's Data Report for the vessel. Of course, the Authorized Inspector must have accepted that the LTA or LTA's meet the acceptance criteria of the Code of construction and the full requirements of the Code shall have been met.

For a copy of the Directive (IB07-006) with all its provisions, you can download it through <http://www.absa.ca/IBIndex/IB07-006.pdf>. ❖

## N A T I O N A L   B O A R D   R E G I S T R A T I O N   O F   I T E M S   M A N U F A C T U R E D T O   C S A   B 5 1

A manufacturer in Canada, subject to compliance with provisions of the National Board NB264 "Criteria for Registration of Boilers, Pressure Vessels and Pressure-Retaining Items" document, is able to register with the National Board, boilers and pressure vessels produced to the CSA B51 Boiler, Pressure Vessel, and Pressure Piping Code.

A survey is being conducted on the United States National Board jurisdictions as to the acceptance of the National Board registered boilers and pressure vessels produced to the CSA B51 Code. For Alberta manufacturers producing boilers and pressure vessels to CSA B51 Code and intend to make them available for use in the United States and elsewhere and are interested to obtain the authorization for National Board Registration, please contact ABSA or the National Board directly for further information. ❖

## P R E S S U R E   P I P I N G   I N S P E C T I O N   R E Q U I R E M E N T S

ABSA inspectors recently assisted Alberta-based fabricators in gaining acceptance of process piping constructed in accordance with ASME B31.3 in Alberta for a customer in Atlantic Canada. In performing installation inspections of the installed piping, the local provincial authorized inspector observed there was no Alberta authorized inspector sign-off on the AB-83 piping construction data report. The piping had been constructed without inspection certification by the Alberta authorized inspector in accordance with CSA B51 clause 4.8. This was not acceptable in the jurisdiction of installation.

The situation was remedied through close cooperation between ABSA inspectors and the Alberta fabricators. The ABSA inspector made thorough reviews of the construction documentation and traveled to the installation location to inspect the piping and witness pressure tests. The fabricators had to dispatch workers to the installation to prepare the piping systems for inspection, which included removal of insulation. Obviously, there was significant inconvenience and cost involved in resolving this problem.

In Alberta, the involvement of the authorized inspector typically is routine only for construction of B31.1 boiler external piping. However, some Canadian jurisdictions mandate strict conformance to CSA B51 clause 4.8 for authorized inspector inspection of all pressure piping construction.

Fabricators were reminded to always check with the jurisdictional authority of the location of installation to determine the requirements for acceptance of pressure piping and all other pressure equipment construction. ❖

## ALERT – ALL BOILER OPERATORS

Furnace explosions and low-water-cut-off malfunctions are the two major causes of accidents relating to boilers and we are seeing an increasing number of incidents relating to these two problems.

To ensure the safety of plant operators and the general public, all precautions must be taken. It is important that light-up procedures must be strictly followed together with periodic checking and testing of all fuel lines and controls.

Testing of the low-water-cut-off controls in accordance with the requirements of the boiler manufacturers, the codes and standards and regulatory provisions is of particular importance since running a boiler dry may result in a major disaster and costly repair to or wholesale replacement of the boiler. ❖

## ABSA SEMINARS

The 'Pressure Piping Fabrication Requirements and Quality Control Seminar' has been well received since it was first presented in February at the Banff Pressure Equipment Conference. All 9 public sessions scheduled through December 2007 have been filled.

The objective of this 2-day seminar is to provide information to the fabricators and users of pressure piping systems about the requirements of the Safety Codes Act, regulations and applicable ASME B31 Codes, and to provide awareness and guidance for the effective implementation of a quality management system, enabling construction of safe piping systems.

Primary focus of the seminar is the pressure equipment O/U companies and small & medium sized pressure piping fabricators. However, large pressure piping fabricators, O/U inspectors, quality control personnel, inspection companies, plant engineering, engineering companies, pressure piping designers and plant maintenance personnel will also benefit from the seminar.

The two day **PESL (Pressure Equipment Safety Legislation) Seminar** is full for all the scheduled dates in 2007. We have added an additional date in November.

ABSA has developed this seminar to assist individuals who wish to enhance their knowledge and understanding of Alberta legislation governing pressure equipment safety. While the seminar does not specifically focus on the Inspector Certification Examination (ICE), it does provide information on the relevant elements of the legislated requirements for pressure equipment safety. The seminar includes presentations on the Safety Codes Act, CSA and ASME codes, governing bodies, quality systems, construction, inspections, accident investigations, repairs and alterations and other topics.

Watch ABSA's web site later this year for the 2008 dates for these seminars. This seminar is also available on a limited basis for in-house presentation. Please e-mail [training@absa.ca](mailto:training@absa.ca) or telephone (780) 437-9100 extension 3311 for more information.

We are planning other ABSA seminars. Please watch [www.absa.ca](http://www.absa.ca) for any additions to the schedule.

## ANNUAL CODE UPDATE SEMINARS

The Annual Update Seminar provides an overview of the effects of the Code changes on designers, quality control inspectors, and other users of the Codes. This year's seminars are schedule for the following dates:

In Edmonton:      Tuesday, October 9, 2007 at The Nisku Inn, Nisku  
 In Calgary:        Thursday, October 11, 2007 at The Blackfoot Inn, Calgary

For more information, please contact Cynthia Formaniuk at (780) 437-9100 Ext 3325. ❖

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