ABSA

THE PRESSURE NEWS

Alberta Boilers Safety Association

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Alberta Regulation Code Adoption Updated

Alberta Regulation AR203/2001 amending the Design, Construction and Installation of Boilers and Pressure Vessels Regulations (AR227/75) was passed and approved by the Lieutenant Governor on November 14, 2001 updating the editions of codes and standards adopted as regulations. Accordingly, the following editions of the codes and standards are now adopted as part of pressure equipment regulations in Alberta:

1. CSA B51-97, Boiler, Pressure Vessel, and Pressure Piping Code:
   - (a) Part 1, Boiler, Pressure Vessel, and Pressure Piping Code including Appendix I Automotive Propane Vessel Standards;
   - (b) Part 2, High-Pressure Cylinders for the Onboard Storage of Natural Gas as a Fuel for Automotive Vehicles;
   - (a) Part 3, Requirements for CNG Refuelling Station Pressure Piping Systems and Ground Storage Vessels;
2. CSA B52-99, Mechanical Refrigeration Code;
3. CSA Z662-1999, Oil and Gas Pipeline Systems;
4. ASME Boiler and Pressure Vessel Code – 2001 Edition;
5. ASME B31.1 – 2001, Power Piping;
6. ASME B31.3 – 1999 Process Plant Piping;
7. ASME B31.4 – 1998 Transportation Systems for Hydrocarbons;
8. ASME B31.5-2000 Refrigeration Piping;
9. ANSI K61.1-1999, Safety Requirements for the Storage and Handling of Anhydrous Ammonia;
10. NFPA 58-1996, Liquefied Petroleum Gas Code;
11. MSS SP-25 – 1998, Standard Marking System for Valves, Fittings, Flanges and Unions;
12. TEMA – 8th Edition, Standards of Tubular Exchanger Manufacturers Association.

It must be noted that codes and standards adopted as part of the regulations and any codes and standards referenced in the adopted codes and standards do not make or imply any assurance or guarantee by the Government with respect to the

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Season's Greetings

Best Wishes for Peace and Joy this Holiday Season
and a New Year of
Health, Happiness and Prosperity

ASME Section IX 2001 Edition 2001 Addenda

The **supplementary** essential variable QW-410.9 was added for the SMAW weld process as per QW-253 in the 2001 Edition of ASME Section IX. The addition of this variable will require qualification for a single weld pass for a weld procedure in which **impact testing is specified**.

This will directly affect welding procedures used for applications where a single weld is to be used for a back weld from one side. Welding procedures may need to be revised to delete reference to a single weld pass or qualified to enable a single weld pass to be used. This will be dependant upon the referenced Procedure Qualification Record(s) that support the welding procedure. It must be clearly noted that with this latest code edition, a Procedure Qualification Record that was qualified using only multiple weld passes will no longer be qualified for a single weld pass when impact testing is specified.

Have you visited us on the Internet yet? - www.albertaboilers.com

ALBERTA REGULATIONS

ABSA is pleased to be working in partnership with officials from Safety Services (Alberta Municipal Affairs) to update three regulations relating to the pressure equipment discipline.

The updating of the regulations will take place in two stages. The review will include making minor editorial changes and inserting an expiry date of March 2004 in the regulations. This stage is necessary because government policy requires all current regulations to be reviewed by March 2003.

The second stage will be to consolidate the three regulations and update the requirements for boilers and pressure vessels and other pressure equipment. Many of the current requirements date from 1975. Consolidation of these three regulations will allow for a more effective delivery of in-service inspection programs for the protection of the public.

The three existing regulations that will be reviewed are:

1. Boilers and Pressure Vessels Regulation (AR 293/94):

   This Regulation establishes:
   - Requirements for the registration of designs in Alberta, and
   - Requirements for inspection certificate permits to start up or to operate a boiler or pressure vessel.

2. Boilers and Pressure Vessels Exemption Order (AR 300/94)

   This Regulation lists equipment that the Minister has exempted from the requirements of the Act and Regulations.

3. Design, Construction and Installation of Boilers and Pressure Vessels Regulations (AR 227/75):

   This Regulation:
   - Lists additional equipment exempt from the Act and Regulations,
   - Adopts appropriate Codes and Standards,
   - Establishes requirements for the registration and approval of designs and welding procedures,
   - Establishes requirements for inspection of boilers and pressure vessels being constructed in Alberta,
   - Establishes inspection requirements for boilers and pressure vessels, and
   - Establishes inspection requirements for boilers and pressure vessels that are in-service or being repaired or modified in Alberta.

ABSA and Alberta Municipal Affairs will consult stakeholders on the proposed changes in the spring of 2002. It is anticipated that the new Pressure Equipment Regulation will be in force in 2003.

NEW TECHNICAL DOCUMENTS
INSERVICE INSPECTION

The following two documents have been developed to clarify the inspection and servicing requirements for pressure equipment and to provide guidance on management of inspection based on risk:

<u>Inspection & Servicing Requirements for Pressure Equipment</u>

The owner of pressure equipment is responsible for complying with the Safety Codes Act and Regulations and for performing appropriate inspections and maintenance of all the pressure equipment to ensure ongoing safe operation.

The document “Inspection & Servicing Requirements for Pressure Equipment” details requirements for inspection of pressure equipment and servicing of pressure relief devices including the basis for progressing to the maximum interval. Applicable information in this document and relevant industry standards shall be used to determine appropriate inspection methods.
This document contains tables showing maximum inspection and servicing intervals. These tables must be used in conjunction with the interval procedure in the document. The owner must be able to provide information to support the inspection or servicing interval that they assign to their pressure equipment.

<u>Risk Based Inspection Programs for Pressure Equipment</u>

This document was released March 27, 2001. Risk Based Inspection (RBI) is a management process by which inspection and other mitigation requirements are determined based on the inherent risk of the pressure equipment. ABSA has provisions for recognizing an Owner-User RBI Program as a basis for determining maximum thorough inspection intervals. The use of RBI for establishing inspection intervals is included in the document “Inspection & Servicing Requirements for Pressure Equipment”.

The Risk Based Inspection Program must be accepted by ABSA. “Risk Based Inspection Programs for Pressure Equipment” defines the essential elements to be addressed in the RBI Program. It is intended to provide guidance so that RBI Programs will be applied correctly, based on sound judgement and principles, to enhance pressure equipment safety in Alberta.

RBI may be applied in any pressure equipment industry sector in Alberta provided that the requirements of the RBI document are satisfied. The owner must have a valid Owner-User Program. The owner must also have the resources and structure to make the program work and must demonstrate that their program meets the requirements of this document.

Both documents are available at albertaboilers.com under “Technical Topics”.

The 6th Annual Pressure Equipment Industry Conference

The Sixth Annual Pressure Equipment Industry Conference will be held at the Banff Centre February 6 – 8, 2002. The theme of the Sixth Annual Conference is "Pressure Equipment Life Cycle – How to . . .". Please visit the Pressure Equipment Industry Conference website, www.sait.ab.ca/pressureconf for more information.

The Pressure Equipment Industry Conference is hosted by the Energy Department at the Southern Alberta Institute of Technology (SAIT), co-sponsored by the Alberta Boilers Safety Association (ABSA) and supported by the Upstream Chief Inspectors Association (UCIA) and the Alberta Refinery and Petrochemical Inspectors Association (ARPIA). The goal of the conferences, past and present, is to promote technical improvement toward excellence in design, safe operation, and inspection of pressure equipment.

JOIN US at the conference and hear the presentations, and meet your colleagues. For the Conference speaker schedule, registration information and trade booth application form please refer to the accompanying documents on the website. You can also contact Kelly Jaskow at 210-4017 or kelly.jaskow@sait.ab.ca.

Oxygen Service Systems

There are many companies and plants that use oxygen in pressurized systems. Some of the services that we are most familiar with are the oxygen cylinders used in oxy-acetylene systems to cut steel or in hospitals for oxygen supply to patients, etc. Some of the other uses are as raw materials in chemical plants in the production of ethylene oxides and other chemicals.

The purpose of this article is to point out the dangers associated with oxygen. Air is composed of about 21% oxygen and 79% nitrogen. In mixture of that proportion, oxygen is very stable and is taken for granted. When oxygen is separated from air and compressed in high pressure cylinders it must be treated with utmost care. One of the properties of oxygen is that it will sustain the combustion of most products. In fact, carbon steel will burn when in pure oxygen service under the right conditions.

Whenever installing an oxygen system, consult your oxygen supplier for guidelines. This article covers some of the points that should be considered prior to placing an oxygen system in service.

- Consider the flow that the system will see and select the material of construction to meet the demands. Remember that should there be rapid pressure drops or turbulence in the system it could cause ignition of the metals.
- The system must be clean of all materials such as oil, grease, fiber, rags, wood, solvents, weld slag, rust, sand and dirt.
- The system should be cleaned with a good solvent such as 99.5% acetone with low residue and wiped with lint free rags.
- No thread lubricants should be used.
- High energy locations may initiate a fire. E.g. high velocity, turbulence, uncontrolled elevation of temperature by adiabatic compression or gas vibration.
- Carbon steel should only be used in "dry" oxygen systems.
- Block valves should not be operated rapidly when there is a high flow and high differential pressure across the valves.
- No socket welds or fillet welds should be used.
- When welding a system, TIG roots should be utilized.
- Safeguard personnel by applying fire shields where necessary and/ or provide means for remote operation of valves and machinery.
- Ensure that personnel have been properly trained in the handling of oxygen.

These are only a few points that should be considered should you choose to use oxygen in your work place or home work shop and should not be considered as the only design parameters for a system. We have had accidents in the province which involved oxygen systems and personnel have been injured. In many cases the accidents were due to systems that were not clean or systems that were not operated properly.

In a recent incident, a technician was burned while opening an oxygen header block valve where the threadolet on the header failed apparently due to an internal combustion. It is suspected that the internal combustion was caused by rapid pressure drop and the possibility of contamination in the valve.

We are certain that with proper safety precautions taken, some ow which are highlighted above, we can avoid many incidents involving oxygen.

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life expectancy, durability or operating performance of equipment and materials referenced in the codes and standards.

You are also cautioned that there may be additional or different requirements enforced in the province as may be provided in the regulations or otherwise over and above the provisions of the adopted codes and standards. As an example, for the use of a design factor of 3.5 as provided for under ASME Section I and Section VIII, Div. 1, Information Bulletin IB99-001 continues to apply. IB99-001 has been updated as IB01-005 . You may download a copy from the ABSA website or obtain a copy from the ABSA office nearest you.

WARNING
USE OF HYDROCARBON REFRIGERANTS

Because of environmental concerns for CFC refrigerants, some people are looking at hydrocarbon refrigerants as possible alternatives. We were alerted to the fact that some people may be promoting the use of hydrocarbons as "drop-in" replacements for other classes of refrigerants even though the refrigeration systems involved have not been designed for and may not be suitable that purpose.

We want to point out that CSA B52 Mechanical Refrigeration Code establishes requirements for design, construction, installation and maintenance of mechanical refrigeration systems so as to minimize the risk of injuries to workers and the general public. Also, CSA B52 is a standard adopted by the "Design, Construction and Installation of Boilers and Pressure Vessels Regulations" and other provincial regulations as part of Alberta's legislated safety requirements. There are specific provisions in CSA B52 for the use of different types of refrigerants including hydrocarbon refrigerants. We understand that the CSA B52 Technical Committee is preparing a news bulletin on this matter and the bulletin will be released in the near future.

We wish to warn all organizations and individuals involved in the use of hydrocarbon refrigerants without meeting the necessary safety requirements provided for by the Code and provincial regulatory requirements that they may be creating an unnecessary safety hazard and will be held liable for doing so.

CONTENTS

PIPE NIPPLE FAILURES

Two pipe nipple failures resulted in fairly extensive damage to two different plants, one in the northwestern sector of the province and another in the central region of the province. In both cases, a 1" nipple was involved although they were of different pipe schedules. Concerns were raised to check if the causes of the two failures were similar.

It was determined that the causes of the failures were different. In one case, the cause of failure was attributed to fatigue and pipe loading on the nipple itself. For the other, frequent removal and reinstallation led to excessive wear on the threads.

A 1" nipple seems fairly small and insignificant. In both of these cases, significant damage was done to the plants involved. Fortunately, neither injuries nor fatalities were involved in either situation. We wish to alert our industry partners that pressure equipment safety depends on each and every component in the plant and all components, no matter how small and seemingly insignificant, must be properly designed and maintained to ensure that pressure equipment safety is not being jeopardized.

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