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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Previous issues of The Pressure News may contain information which is outdated or no longer valid.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.

ALERT

PRESSURE EQUIPMENT IN HYDROGEN SERVICE

It is important for each owner and user of pressure equipment in hydrogen service to review the information recently published by the U.S. Chemical Safety Board (CSB), and to take appropriate action to ensure the safe operation of their pressure equipment in hydrogen service.

When the CSB published their report, the Administrator issued an Information Bulletin, IB16-013 ALERT [Preventing High Temperature Hydrogen Attack \(HTHA\)](#), to bring the CSB report to the attention of our stakeholders.

“Washington, DC August 11, 2016 – Today the U.S. Chemical Safety Board (CSB) issued a safety alert entitled “CSB Safety Alert: Preventing High Temperature Hydrogen Attack (HTHA)” focused on preventing accidents similar to the fatal 2010 explosion and fire at the Tesoro Refinery in Anacortes, WA that fatally injured 7 workers.”

“The CSB’s investigation into the catastrophic failure of a forty-year-old heat exchanger at the Tesoro Refinery in Anacortes, Washington, determined that the fatal explosion and fire was caused by a damage mechanism known as high temperature hydrogen attack, or HTHA, which severely cracked and weakened the carbon steel heat exchanger over time, leading to a rupture”.

The following are some highlights from the CSB report:

The CSB investigation of the Tesoro accident identified that API RP 941 did not predict that HTHA could occur in the operating region of the vessel and *“the carbon steel Nelson curve has repeatedly proven to be unreliable to predict HTHA”.*

The CSB safety alert provides the following guidance to prevent HTHA equipment failure:

- “1. Identify all carbon steel equipment in hydrogen service that has the potential to harm workers or communities due to catastrophic failure;*
- 2. Verify actual operating conditions (hydrogen partial pressure and temperature) for the identified carbon steel equipment;*
- 3. Replace carbon steel process equipment that operates above 400 °F and greater than 50 psia hydrogen partial pressure; and*
- 4. Use inherently safer materials, such as steels with higher chromium and molybdenum content.” ❖*

FREEZING OF PRESSURE EQUIPMENT

Alberta can get very cold in winter months. When temperatures get low, things tend to freeze, and if pressure equipment is not properly prepared, it can easily be damaged by the expansion of contained fluids as they freeze. These incidents result in significant financial losses both in damage to property and in plant down-time. Worse still, such damage can go unnoticed and subsequent operation of the equipment may have huge safety implications, with the potential for a catastrophic failure causing injuries and deaths.

Over the last few years, we have received a number of incident reports detailing damage to pressure-retaining components due to freezing. There were also reports of significant overpressure of equipment because the freezing incident had isolated the equipment from its overpressure protection. Fortunately, in the last five years, there have been no serious injuries or fatalities as a result of these types of incidents, although the costs relating to repairing the affected equipment and loss of production time ran into the millions.

Through the winter months of 2015 November through 2016 January, ABSA received 17 incident notifications, four of which involved damage to equipment due to freezing. Of the four freezing incidents, three resulted in ruptured piping with two of these due to inoperative heat tracing and one due to isolation of the line. The fourth freezing incident was due to low fluid circulation in an air-cooled heat exchanger. Fortunately, no personnel were harmed in any of these incidents.

In order to help mitigate these occurrences, it is important that equipment owners implement an effective pressure equipment winterization program. It is also imperative that any pressure equipment affected by a freezing incident be taken out of service immediately. If freezing has been suspected or observed, the pressure equipment involved must not be placed back into pressure service until they've been subjected to a proper inspection and integrity evaluation. The use of damaged components in pressure service can be highly hazardous, and components damaged by freezing often cannot be repaired.

Plant owners are cautioned that pressure equipment that has been subjected to freezing, even including small parts such as valves and other fittings, could be unfit for service.

A public alert, issued in 2004, gives information about an incident in which a valve, that was likely damaged in a freezing incident, later failed killing one worker. The alert (IB04-003) is available on our webpage at <http://www.absa.ca/wp-content/uploads/2012/08/ib04-00311.pdf>, and its lesson is as pertinent today as when it was released in 2004. ❖



ANNUAL CODE UPDATE SEMINAR

ABSA will soon be delivering the Annual Code Update Seminar. The seminar will be held in Edmonton on October 7, Calgary on October 14 and Red Deer on October 21. Exact locations for seminar events, and registration information, can be found on our website www.absa.ca.

This seminar provides an overview of upcoming Code changes and an update on program areas to Designers, Quality Control Inspectors, and other users of the Codes. The topics of discussion this year will include:

- Overview of changes in the 2016 Edition of ASME B31.1 Power Piping Code;
- Overview of the AB-521 document, Requirements for Engineered Pressure Enclosures;
- Overview of several AB-500 documents (e.g. AB-511, AB-528, AB-529);
- Overview of the recent ABSA organizational changes;
- Update on changes in the Design Registration Process including overview of AB-530 and AB-531 documents;
- Overview of new or revised ABSA Documents and Information Bulletins;
- Upcoming changes in Codes and Standards;
- Open forum discussion. ❖

INTRODUCTION TO ELECTRONIC DESIGN SUBMISSIONS

ABSA is developing and modernizing our use of computer technology in the design submission and registration processes. A major portion of this work has been to establish a process by which design submissions can be accepted electronically via email, rather than requiring submitters to send duplicate hard copies to our office. Electronic submissions have been limited to designs which can be documented on 11x17 or smaller paper. Fitting and piping submissions have been excluded because the nature of some documents typically seen with these submissions makes them impractical for electronic submission.

In May, a pilot project was launched in which we began to accept electronic submissions of weld procedures and some simple vessels from a few submitters on a trial basis. Initial feedback was that submitters were very pleased with how quickly they received an initial acknowledgement of their submission, and how quickly a scanned copy of the registered design was returned to them via email rather than in hard copy. No major problems were encountered in the initial trial phase and, given the positive feedback, we began to encourage all weld procedure submitters and a large number of additional pressure vessel design submitters to make their submissions electronically.

There are extra administrative steps required in handling submissions that are received electronically and a small administrative fee to cover the required time has generally been charged. Most submitters have been of the opinion that the extra charge is more than offset by avoiding the hassle and associated costs of having to provide hard copies by courier, and having to wait for a hard-copy response.

In order to keep the electronic submission process straightforward and consistent, certain requirements are imposed on the file types to be used and the way they are organized and attached to emails. As of August 2016, information about these requirements and how to make an electronic submission has been posted on the 'Design Survey' section of our website at <http://www.absa.ca/design-registration/requirements-for-electronic-submissions/>. Submitters are encouraged to make their submissions electronically, when appropriate, and to provide feedback or suggestions.

Further development may include consideration for fitting and piping submissions to be received electronically, and possible consideration for designs which are documented on large-format drawings, although no tentative timeline has been established. ❖

REVISED DESIGN REGISTRATION APPLICATION, FORM AB-31

ABSA has revised the Design Registration Application form to make it clearer by changing the layout and providing features which the previous form did not have. Some key revisions are:

- The invoice will be sent to, and the documents will be returned to, the Submitter;
- The full legal name and address of the Manufacturer and Submitter are required;
- Design submissions that require reciprocal registration, using ABSA's reciprocal registration process, can now specify which provinces and/or territories are required;
- Space is now provided for the registration number of a design that has been registered.

The *Design Registration Application* is used to initiate the design registration process and to ensure that each submission is tracked. It is used by ABSA Design Survey to document the type of registration sought, who to invoice, and who should receive the registration documents. A correctly completed AB-31 form provides the minimum amount of information needed to initiate the process and to assign a tracking number. Once the tracking number has been issued, the submission can be queued for an initial review with Design Survey. Many of the Design Registration Application forms received have not been properly completed, and this adds delays to the design registration process. ❖

NEW AB-525 OVERPRESSURE PROTECTION SEMINAR

ABSA is pleased to make available a half-day seminar on document AB-525, Overpressure Protection Requirements for Pressure Vessels and Pressure Piping.

This seminar will outline governing legislation and compliance approaches to AB-525. Attending this seminar will help you understand what is required for overpressure protection. This will benefit all industry personnel involved in overpressure protection. To register, please follow the link: <http://www.absa.ca/seminars/course-listing/> ❖

2016 SEMINARS

Designing, maintaining and operating pressure equipment has its unique challenges. To assist in these challenges, ABSA has a wide range of course offerings. Let ABSA's learning leaders expand the relevance of training as it relates to pressure equipment safety. Choose from the following courses to take advantage of ABSA's combined experience that will create that genuine advantage for you. Below are the remaining seminars for 2016.

Session Date	Seminar	Location
2016-09-19	AB-528 Requirements for Reduced Supervision	Calgary
2016-09-27/28	Repair and Alteration	Calgary
2016-09-29/30	Pressure Equipment Safety Legislation	Edmonton
2016-10-07	Annual Code Update	Edmonton
2016-10-12/13	Pressure Piping Fabrication Requirements and Quality Control	Calgary
2016-10-14	Annual Code Update	Calgary
2016-10-21	Annual Code Update	Red Deer
2016-10-25/26/27	Quality Systems & Inspection for Pressure Equipment Construction	Calgary
2016-10-25	Regulatory Information for Power Engineers	Calgary
2016-10-31	AB-525 Overpressure Protection	Edmonton
2016-11-03/04	Pressure Equipment Safety Legislation	Calgary
2016-11-08/09	Design Registration	Edmonton
2016-11-23/24	Pressure Piping Fabrication Requirements and Quality Control	Edmonton
2016-11-29/30	Pressure Relief Devices Requirements and Recommended Practices	Calgary
2016-12-01/02	Pressure Equipment Safety Legislation	Edmonton
2016-12-13/14	Pressure Piping Fabrication Requirements and Quality Control	Calgary



CHIEF POWER ENGINEER CONFERENCE

The Alberta Chief Power Engineers Education Conference Committee is holding its 2nd conference in Calgary on October 26, 2016.

Chief Power Engineers and Persons in Charge of a plant (e.g. power plant, heating plant or thermal liquid heating system) are invited to attend and can invite one other person to attend. Approved Power Engineering Training Providers (e.g. colleges, institutes who teach power engineering) are also invited to attend.

The Conference is an excellent way to find out what is going on in Industry and at ABSA. Make sure to register early to ensure your spot.

Please visit www.absa.ca for the registration form, and information for those who would like to become a conference sponsor.

ABSA will be presenting a pre-conference seminar, Regulatory Information for Power Engineers, on October 25. Information about the seminar can be found on the ABSA website. ❖

NEW INFORMATION BULLETINS

The following are the latest Information Bulletins issued by the Administrator. You can view them at www.absa.ca.

IB16-013 ALERT [Preventing High Temperature Hydrogen Attack \(HTHA\)](#) – This ALERT provides information about the safety alert issued by the U.S. Chemical Safety Board (CSB) following the completion of their investigation of the fatal 2010 explosion and fire at the Tesoro Refinery. The CSB safety alert makes recommendations regarding carbon steel used in hydrogen service and identifies that “*the carbon steel Nelson curve has repeatedly proven to be unreliable to predict HTHA*”.

IB16-012 [Requirements for Reduced Supervision](#) – Establishes Edition 2 of ABSA document AB-528, Reduced Supervision of Power Plants, Thermal Liquid Heating Systems, and Heating Plants to define requirements for reduced supervision.

IB16-011 Rev. 1 [Information Bulletins issued as Standata by Alberta Municipal Affairs Governing Gas and Pressure Equipment Safety](#) – Revisions to the following three STANDATA were issued in June 2016: Liquefied Petroleum Gas Storage Vessel Installations; Fuel Gas Pressure Piping in Plants; Propane Storage Tanks Designed for 200 PSIG. ❖

DOCUMENTS ISSUED BY ABSA

The following documents issued by ABSA are available at www.absa.ca.

2016-07-14 - AB-528, Edition 2, Revision 0, *Requirements for Reduced Supervision of Power Plants, Thermal Liquid Heating Systems and Heating Plants*: Edition 2 is an editorial revision with no change in requirements; this document establishes requirements for certain plants, in a remotely located facility, to be operated with reduced supervision. ❖

ABSA's 2017 Seminar Schedule is Now Available!

Please visit us at

<http://www.absa.ca/seminars/course-listing/>

to view our upcoming 2017 dates.

Registration is now open!

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