

# ABSA THE PRESSURE NEWS

Alberta Boilers Safety Association

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## UPDATE 2000 SEMINARS

The recently held seminars on anticipated code trends, latest Code changes, ABSA audit & ASME review findings, data reports and reasons for delays in design registration were very well attended with 81 people attending in Calgary and 95 people attending in Edmonton. The feedback we received was very supportive. The enthusiastic participation by industry in these sessions is always appreciated.

While these seminars were primarily directed at the pressure vessel and heat exchanger manufacturing community, they were attended by a number of end users, engineering companies and inspection companies as well. ABSA would like to hear from other parts of the pressure equipment industry with suggestions for other seminars. Would a session on piping design submissions be worthwhile? Handling repair procedures? Quality control issues in general? Or...? When would be a good time? Is a half day preferable to a full day? E-mail your suggestions to:

[webmaster@albertaboilers.com](mailto:webmaster@albertaboilers.com).



## THIS JUST IN FROM NUNAVUT

"At the August meeting of CSA B51, the letter 'N' was assigned for CRNs registered in Nunavut. Effective the first of January, 2001, all boilers and pressure vessels intended for installation in Nunavut will be required to have their designs registered in Nunavut and the letter 'N' added to the CRN. We will, of course, accept applications at any time. Designs registered in the Northwest Territories previously will not be required to be re-registered as

we were under the same legislation."

In a recent telephone conversation with Bill Bachellier, Chief Boiler Inspector for Nunavut, Bill indicated that, in all likelihood, Nunavut will require that boilers and pressure vessels destined for Nunavut be registered with the National Board. If you are shipping equipment to Nunavut, be sure to check whether this has become a requirement.

The address and contact numbers for our new neighbours to the North are:

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**Have you visited us on the Internet yet? - [www.albertaboilers.com](http://www.albertaboilers.com)**

## FLARE KNOCK-OUT DRUM INCIDENT

A recent incident in Northwestern Alberta, regarding a two year old flare knock-out drum, points out the need for regular routine inspection of this type of equipment installed at process plants.

This vessel is typical of most flare separators in that they are usually built to ASME Section VIII Div I with a 50 Psig MAWP. They are typically vented to the atmosphere through the flare system and operate at less than 15 Psig. As a result, they are not subject to the requirements of the Safety Codes Act relative to annual registration, design registration, or regular inspections.

The owner, in exercising due diligence over every item in his facility, opened this vessel for routine inspection and cleaning after approximately two years of operation. The vessel was about 1/2 full of material that proved to contain 74% iron sulphide. Upon cleaning, extreme internal corrosion (more than 50% of wall thickness) was noted. Further inspection revealed extreme internal and external hydrogen blistering and cracking. Shear wave ultrasonic examination could not identify any portion of the vessel shell that was free of cracks. The deterioration was so extreme that the owner's Chief Inspector rejected it for further use and ordered replacement rather than attempting repairs.

Had failure of this vessel occurred, sour and combustible gases would have been released into the plant's atmosphere creating both a fire hazard and H<sub>2</sub>S hazard for the plant and its personnel. This is definitely a case where appropriate inspection of equipment, that is often neglected, prevented a potentially severe accident.



## PLANT PIPING - OWNER'S RESPONSIBILITIES

Do you ever ask yourself what your responsibilities as a Plant Owner\* are under the Safety Codes Act and the Pressure Piping Codes that have been declared to be in force under the Act? Do you rely exclusively on your piping Contractor to meet all regulatory and Code requirements because he has the Certificate of Authorization from ABSA? If so, read on.

As is well known, ABSA does not, as a general rule, inspect pressure piping during construction. B31.3 stipulates that it is the Owner's responsibility, exercised through the Owner's Inspector, to verify that all required examinations and testing have been completed and to inspect the piping to the extent necessary to be satisfied that it conforms to all applicable examination requirements of the Code and of the engineering design. This Inspector must be an employee of the Owner or a designated agent of the Owner. Per B31.3 the Inspector cannot be an employee of or be responsible to the Contractor (*i.e.* the piping manufacturer, fabricator or erector) unless that Contractor is also the Owner of the plant. It is ABSA's policy that this restriction also apply to B31.1 piping.

The Pressure Piping Codes establish that the Owner's Inspector "shall have access to any place where work concerned with the piping installation is being performed. This includes manufacture, fabrication, heat treatment, assembly, erection, examination and testing of the piping. (The Inspector) shall have the right to audit any examination, to inspect the piping using any examination method specified in the engineering design, and to review all certifications and records necessary to satisfy the Owner's responsibilities..." These rights confer responsibility on the Owner's Inspector to conduct these activities.

B31.3 also sets requirements for the qualifications of the Owner's Inspector that the Owner must comply with.

It could be extremely important that the Inspector accumulate records of examinations or tests performed by the Contractor or nondestructive examination company as the work proceeds. Likewise, keeping track of welding procedure, welder or welding operator qualifications and weld maps on an ongoing basis could prove invaluable. If the Inspector merely makes his mark on the records as the job proceeds, in anticipation of receiving the full job package at the end of the project, he will not only have a significant amount of paperwork to sort through after the fact, but may be distressed to find that some of the records were not provided or certifications were not in place.

What do you do if there is no weld map recording which welder did which weld or no record of the welders' marks? If the piping is insulated, how do you know which welder performed which weld? Was he/she qualified for that weld or not? It could be very difficult, if not impossible, to recreate missing records after the completion of the physical work. And, welds performed by an unqualified welder would have to be removed.

The Design Construction and Installation of Boilers and Pressure Vessels Regulations mandates that Pressure Piping Construction and Test Data Reports (Form AB-83 or equivalent) be completed by the Contractor for all piping and that these shall be delivered to the Owner, who shall retain them for at least 5 years and produce them on the request of a Safety Codes Officer. The AB-83 forms are required to be provided to the Owner *prior to the initial operation of any pressure piping system*. The regulations do not, however, mandate that other records, with the exception of the Completion of Construction Declaration, be provided. The Completion of Construction Declaration (Form AB-31) attesting to the fact that the construction was carried out in accordance with the

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regulations and that the Pressure Piping Construction and Test Data Reports had been delivered to the Owner is an after-the-fact document that is required to be supplied to the Administrator.

Protect your project. Gather the necessary records along the way, even if the contract calls for a complete data package at the end of the job. You could be very glad you did.

\* Per the Act, "owner" includes a lessee, a person in charge, a person who has care and control and a person who holds himself out as having the powers and authority of ownership or who for the time being exercises the powers and authority of ownership.

### FIFTH ANNUAL PRESSURE EQUIPMENT INDUSTRY CONFERENCE

The Energy Department of SAIT, with support from ABSA is co-ordinating the Fifth Annual Pressure Equipment Industry Conference scheduled for February 7-9, 2001.

Representatives from the Alberta Refinery and Petrochemical Inspectors Association (ARPIA) and the Upstream Chief Inspectors Association (UCIA) have been actively involved in planning the conference technical topics.

The theme of the conference is "Risk Based Inspection". Mr. Dave Boone, Executive Vice President of Pan Canadian Petroleum Ltd. will be the Keynote Speaker.

For more information, please contact The Energy Department of SAIT:

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## A CHECKLIST FOR DESIGN SUBMISSIONS

Based on a survey of deficiencies in pressure vessel and heat exchanger designs submitted to ABSA over the last year, here are the most common things submitters should watch for:

- Are all necessary dimensions shown on the drawing?
- Do the things calculated correspond to the items on the drawings?
- Was the corrosion allowance shown on the drawing used in the calculations?
- Are all pressure part materials identified by their SA or SB Specification numbers complete with grades, types etc. as applicable?
- Is the breaking of the inside corners of nozzles as required by ASME VIII-1, para. UW-16(a)(3) described by individual details or by a general note?
- Are inspection openings, as required by the regulations, provided?
- Is the minimum thickness after forming specified for dished heads?
- Do weld sizes satisfy the requirements of UW-16?
- Are weld details shown for all welds, by AWS weld symbols or by detail sketches?
- Are all impact-tested materials identified as being impact tested?
- Are all reasons for not impact testing identified by the proper Code paragraph reference? Are the references complete?
- Is the design information complete - MAWP, design temperature, MDMT, Code Edition & Addenda?
- Are there any groupings of openings that should be checked to see if they comply with UG-36(c)(3)(d)? Have the separations of the openings been calculated and compared with UG-36(c)(3)(d)?

- Has every pressure part on the design been verified in the accompanying calculations?
- If the drawing has been revised before it was submitted, do the calculations continue to reflect the item shown on the drawing? Do the calculations reflect the revision?
- Are there any manual changes to a CAD drawing? (There should not be!)
- Is all Code-required NDE shown on the drawing? Do UW-11 references support the calculations?
- Is the proper hydrostatic test pressure shown on the drawing?
- Are the required holding temperature and holding time for heat treatment shown on the drawing?

One test of whether a design is complete or not is to ask: "Could I, without knowing anything else about company procedures and without asking for additional information, build this vessel as it was intended to be built?" This, of course, doesn't address whether the design is correct, only if it is complete.

Miscalculation of nozzle reinforcement continues to be a common problem. There is no checklist item for this, but the designer must get it right.

This is not meant to be an exhaustive list of the things that must be checked. It does, however, reflect the most common causes of design registration's being held up for corrections. It is hoped that the list will prove helpful to some.

### CORRECTION TO ARTICLE

Audit of Pressure Relief Valves  
Servicing Organizations  
Vol. 5, Issue 3, September 2000

The 2nd sentence of the 2nd last paragraph should read:

"... that the API capacities were **not** higher than that permitted by NB-18."

## INSTALLATION INSPECTIONS

Pressure equipment must be inspected at the time of installation after all fabrication work is complete. The purpose of this inspection is to verify the equipment is safe for operation, and to initiate inspection records for the equipment. The minimum installation inspection should include the following:

1. For use in Alberta, verify the vessel's design has a valid CRN for Alberta, and that the vessel itself is registered and has been issued an "A-number". If the vessel has no Alberta CRN or "A-number", the vessel is not to be placed in service until an ABSA Safety Codes Officer issues a certificate of inspection for the vessel.
2. Verify the nameplate information against the manufacturer's data report and design requirements.
3. Verify equipment is installed correctly; supports are adequate and secured, exterior equipment such as ladders are secured, installation is properly installed, flanged and other mechanical connections are properly made - all studs and nuts are installed.
4. Verify overpressure protection to ensure installed pressure relief devices satisfy design requirements in terms of set

pressure and required relieving capacity, and that these devices are properly installed.

5. Verify control equipment is installed correctly; check valves are oriented properly, valves are in the correct position.
6. Verify piping installation; hangers, supports, shoes and anchors satisfy design requirements.
7. It is not necessary to do internal inspections of vessels that have never been in service, however internal inspection and UT thickness surveys are recommended to establish baseline data.

Installation inspections are to be carried out by qualified pressure equipment inspectors, and the results documented. In Alberta all pressure equipment is subject to installation inspection by an ABSA Safety Codes Officer. However, for companies with an ABSA-certified Owner/User Program (OUP), the installation inspection of equipment having an "A-number" may be delegated to inspectors qualified under the program. The inspections are to be made in accordance with written procedures, and included in the summary inspection reports submitted to ABSA.

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