

ABSA THE PRESSURE NEWS

Alberta Boilers Safety Association

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LAUNCHING OF www.sopeec.org

Examinations and Certifications for Power Engineers across Canada, including all Provinces and Territories with the exception of Quebec is co-ordinated through the Standardization of Power Engineering Examinations Committee (SOPEEC) which is supported by the Government of Canada and all SOPEEC provincial and territorial member jurisdictions. This committee works under the auspices of the Canadian Association of Chief Inspectors (ACI) and makes recommendations to the ACI on all issues relative to the Power Engineering program, including power engineering course content and curriculum, syllabi, examinations and certifications. Through the SOPEEC operation, power engineers receive reciprocal certification in all SOPEEC member jurisdictions

The Standardization of Power Engineering Examinations Committee (SOPEEC) is launching its web site. Please visit this web site to find out more about SOPEEC's mandate, its membership, examination information, interesting links, ... etc.

The province of Alberta, through delegation to Alberta Boilers Safety Association (ABSA), is the coordinating provincial jurisdiction of SOPEEC. ABSA is also responsible for the maintenance of this SOPEEC web site. We

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INTER-PROVINCIAL RECIPROCAL RECOGNITION OF PRESSURE WELDER CERTIFICATE NOVA SCOTIA AND MANITOBA ADDED TO THE LIST

We are pleased to report that since March agreements have been signed with the provinces of Nova Scotia and Manitoba for reciprocal recognition of pressure welders between Alberta and these jurisdictions. Through these agreements, provided certain provisions are met, a pressure welder from one of these jurisdictions may obtain a certificate to perform pressure welding in Alberta and vice versa without an initial performance qualification certification examination.

These reciprocal recognition agreements allow for the free movement of qualified pressure welders across provincial borders and better efficiency in the pressure equipment industry. Similar agreements had previously been reached with other jurisdictions. Pressure welders with current certifications from these jurisdictions as indicated hereunder may obtain a Grade "B" Certificate of Competency in Alberta:

Province/Territories	Valid Pressure Welder Certificate/License
British Columbia	BCP-100
Saskatchewan	Material P1 Filler F3/F4
Manitoba	High Pressure Welder License Classes F3/F4 or F4
Nova Scotia	NS-01
Newfoundland	GSC-100
Yukon Territories	Mtl P1 Filler F3/F4
Northwest Territories	Mtl P1 Filler F3/F4

Pressure welders from these jurisdictions must also be in possession of an Inter-provincial Red Seal journeyman certificate or qualification acceptable to Alberta Advanced Education and Career Development. You may obtain details of the requirements from the Boiler's Branch of the provincial jurisdiction concerned or from your nearest ABSA office.

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

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would like to hear your comments as to what we could improve on in order to help make this web site more useful for all power engineers and everyone associated with power engineering across Canada.

ALERT USE OF REGISTERED FITTINGS

An incident occurred recently at a dry cleaning facility due to an unsuitable and unregistered fitting's being installed on a high pressure steam boiler. The fitting has been purchased at a hardware store and installed on the boiler water column drain assembly.

A contractor was working on the boiler in the vicinity of the water column while the boiler was in operation. He inadvertently knocked the drain piping. The stress caused the fitting to break at the transition between the inlet bottom threads and the body. The boiler water flashed into steam and the contractor was burnt about his body, necessitating hospital treatment.

Only suitably rated, registered fittings shall ever be installed on pressure equipment.

ASME SECTION IX 2000 ADDENDA

There is a proposal to revise ASME Section IX to permit the use of some AWS Standard Welding Procedure Specifications. This proposal will likely be included in the 2000 Addenda which is scheduled for publication in July 2000. We will provide information on the ABSA web-site relative to this proposed revision to ASME Section IX as soon as this Addenda becomes available and details of the revision are confirmed. We will also try to include further information in the September issue of the ABSA Newsletter.

PRESSURE RELIEF VALVES ON BOILERS

Many questions arise about the selection, sizing and installation of safety or safety relief valves on boilers. The term "pressure relief valve" (PRV) used here means safety valve or safety relief valve as appropriate to the service. This article will address some of the issues we encounter.

1) Is the boiler a heating boiler or a power boiler? A hot water (or glycol) boiler stamped for a maximum allowable working pressure of 160 psig or less may be a heating boiler. Those bearing the ASME "H" stamp are definitely heating boilers but for boilers built under the CSA B51 Code it may be necessary to examine the Manufacturer's Data Report to determine whether the code of construction is ASME Section I (Power Boilers) or ASME Section IV (Heating Boilers.) Experienced personnel may be able to determine the difference from the layout of the nameplate. A steam boiler with an MAWP of not more than 15 psig and marked with the ASME "H" stamp is a low pressure steam boiler, also called a steam heating boiler. As with the hot water boilers, it may be a little less obvious whether ASME Section I or Section IV applies to the construction of a steam boiler built and marked under the CSA B51 Code. If the steam boiler has an MAWP above 15 psig or a water boiler has an MAWP greater than 160 psig it would have to have been built in accordance with ASME Section I, *i.e.* it would be a power boiler.

2) Determine the type of safety or safety relief valve that must be used on the boiler. For a heating boiler, *i.e.* a boiler built in accordance with ASME Section IV rules, the PRV must have the ASME "HV" or "V" on the nameplate. If the boiler is power boiler built in accordance with ASME Section I the PRV must have the ASME "V" symbol on the nameplate.

3) The PRV must be capable of relieving the full output of the boiler without a pressure rise of more than a limited amount above the MAWP. For a hot water heating boiler, the limit is

10% above the set pressure of the safety relief valve; for a steam heating boiler it is 5 psig above the set pressure of the safety valve. Power boiler PRVs are required to relieve their rated capacities at not more than the greater of 2 psi or 3% of their set pressure.

4) Power boilers that have more than 500 sq. ft. of bare tube water-heating surface or more than 1100 kW electric power input must have more than one PRV.

The above are only some of the considerations for proper selection of PRVs on heating boilers (ASME Section IV construction) and power boilers (ASME Section I construction.) For complete details the reader should refer to ASME Section IV, Part HG, Article 4 for heating boilers and to ASME Section I paragraphs PG-67 through PG-72.4 for power boilers.

Here are some of the violations we have encountered on power boilers:

- The PRV is found installed in the horizontal position. PG-71.2 states that PRVs are to be installed upright with their spindles in the vertical position.
- The PRV has a bushing in the inlet or outlet to adapt the boiler opening to the valve or the vent pipe to the valve. PG-71.3 states that the opening between the safety valve and the boiler shall have at least the area of the valve inlet and that when a discharge pipe is used, the cross-sectional area of that pipe shall be not less than the full area of the valve outlet or of the total of the areas of the valve outlets discharging through that pipe.
- PRVs are found mounted on piping at some distance from the boiler. PG-71.2 states that the PRV must be mounted as close as possible to the boiler or the normal steam flow path and in no case further than the face-to-face dimension of the corresponding tee fitting of the

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DESIGN CALCULATION CONTROL

What follows is a partial list of nonconformances associated with design calculations, which have recently been identified in ASME joint reviews and routine audits. Paragraph 10-5 of Appendix 10 of ASME Section VIII, Division 1 (and parallel clauses in other Code Sections) requires that "The Manufacturer's or Assembler's Quality Control System shall provide procedures which will ensure that the latest applicable drawings, design calculations, specifications and instructions, required by the Code, as well as authorized changes, are used for manufacture, examination, inspection and testing."

1) Vessel design calculations are found to be lacking page control or revision control. The cover sheet should show the total number of pages attached. The pages shall be consecutively numbered and shall provide for a revision indicator. There shall be a record of the revisions to the calculations and there shall also be a means of showing that the calculations have been determined to still be applicable or have been revised whenever the drawings have been

revised.

- 2) Calculations are not provided for all applicable loadings. Loadings that are specified in Code paragraph UG-22 *must* be considered. For example, if the vessel has support lugs, there must be calculations for the loads imposed on the vessel by those lugs. See UG-22 for other loadings that must be considered when they are applicable. If there are no nozzle loads specified or no other UG-22 loadings apply, a statement such as "Vessel calculations have considered all applicable loadings in accordance with UG-22" should be acceptable.
- 3) The Manufacturer has failed to sign off the calculations or revisions to the calculations. There shall be approval of the calculations by signature and date by the person specified as being responsible for this function in the Quality Control Manual.
- 4) There is no indication in the calculations of whether or not impact tests are required and, if not, what specific Code paragraph and subparagraph permits the exemption. For example, ASME B16.5 ferritic steel flanges for use

at an MDMT not colder than minus 20 degrees F could be exempted from impact testing by paragraph UCS-66(c), but just invoking paragraph UCS-66 would be inadequate. Likewise, not indicating any exemption paragraph would be a deficiency. Note that when the exemption is based on UG-20(f), all five of the criteria of UG-20(f) must be satisfied and there shall be a statement to this effect in the calculations.

- 5) Design calculations do not indicate the Code Edition and Addenda to which they are performed. It is essential that these be identified on the calculations.
- 6) Old calculations used for a new vessel do not indicate that they have been verified as complying with the Code Edition and Addenda under which the vessel must be built. This commonly applies to vessels of a standard design that are built repeatedly. Once a new set of addenda or a new Code Edition becomes mandatory, the calculations must reflect that they comply with that Edition and Addenda.

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same diameter as the valve inlet.

- Mufflers with diameters smaller than the outlet of the safety valve have been found. PG-71.4 states that if a muffler is used it must have sufficient outlet area to prevent back pressure from interfering with the proper operation and discharge capacity of the valve.

There are many elements to be considered when selecting and installing safety or safety relief valves. Please refer to appropriate codes and standards prior to starting such a project. **Remember that pressure relief valves are the last line of defense from overpressure and potential catastrophic failure of the boiler.**

NEWS FROM NATIONAL BOARD NATIONAL BOARD REGISTRATION OF CSA B51 BOILERS AND PRESSURE VESSELS

Registration of boilers and pressure vessels built to CSA B-51 with the National Board has been a possibility since 1998. This is due to a document titled "Criteria for Registration" which was developed by the National Board at the request of "the jurisdiction" members. CSA B-51 was the first standard to be determined to be in compliance with the criteria.

Since the development of the criteria, some jurisdictions have amended their laws and rules to allow the use of boilers and pressure vessels built to various standards so long as registration with the National Board

was completed.

Questions have been asked of the National Board regarding the implementation of the application process leading to authorization to register boilers and pressure vessels built to CSA B-51. In an attempt to respond to these questions, the following has been prepared.

The process leading to authorization to register CSA B-51 boilers and pressure vessels begins with the manufacturer submitting an application to the National Board.

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Once the application package, along with a deposit of two thousand five hundred dollars (US) have been received, a joint review of the manufacturers quality program can be scheduled. The purpose of the joint review is to determine if the applicant has a written quality system and has the ability to implement the program that complies with the elements required by the criteria document. This joint review will be conducted by the National Board, along with the Authorized Inspection Agency. Assuming no discrepancies are discovered during the review, authorization to register will be granted to the applicant. We anticipate the deposit will cover all the fees and expenses associated with obtaining authorization. In some instances, charges could be higher depending on location and timing of the joint review.

Registration of boilers and pressure vessels is a process which includes specific duties assigned to the Authorized Inspector. These duties are usually beyond those included in the construction standard. The registration is documented by the filing of the manufacturers data report with the National Board. This filing will ensure the availability of the data report forever. The data report is available to the registrant at no cost. The cost of filing the data report currently ranges from US\$1.25 to US\$85.00 based on size of the boiler or pressure vessel.

RECAP HEATING PLANT GENERAL SUPERVISION

This following is a recap on the provisions of Heating Plant General Supervision with respect to operator requirements including the Fifth Class and New Fourth Class Certificates of Competency.

1. Heating plants rated at more than 750 kW to a maximum of 3000 kW require general supervision by a holder of an appropriate Certificate of Competency. This now includes: Building Operator B, Building Operator A, Fifth Class, New Fourth Class, Third Class, Second Class or First Class Power Engineer *.
2. Heating plants rated at more than 3000 kW require general supervision by a holder of an appropriate Certificate of Competency. This now includes: Building Operator A, New Fourth Class, Third Class, Second Class or First Class Power Engineer *.

** Note: An old Fourth Class Power Engineer Certificate dated earlier than September 1998 does not qualify the holder to supervise a heating plant.*

The "General Supervision" requirements have not changed. Please refer to the article on "Heating Plant - General Supervision" in Volume 2, Issue 4, August 1997 of The Pressure News.

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