

FLARE LINES AND FLARE KNOCKOUTS

Flare lines, flare knockouts and associated equipment are typically open to atmosphere and exempted from the Safety Codes Act. However, if not installed, maintained and operated properly, they could pose considerable safety hazards as well as impacting on pressure equipment.

Earlier this spring, a fatality occurred at a sour battery site. Investigation noted that sour gas escaping from a manway on a flare knockout drum might have contributed to the incident. Flare knockout drums are designed for limited pressure. Any restriction downstream of the flare knockout drum will result in a pressure buildup in the drum and possibly an over-pressure situation. The most common problems that occur at the bottom of the flare stacks are that the line might freeze due to moisture in the line or the flame arrester plugs off from carbon products generated from combustion that occurs near the flame arrester.

This article will point out some of the areas that should be checked during initial installation of flares and flare knockouts and also what should be checked during each turnaround.

Lines to the flare should be sloped back to the flare knockout so that liquids will drain back to the flare knockout.

The flame arrester should be checked at every opportunity to ensure that it is clean.

On some installations, a larger diameter line is installed at the base of the flare. This line will act as a debris trap. This line should be checked as it will eventually build up with debris to the point where it could be blocked off.

Most plants have a flare line that runs the full length of the plant. The line in the plant needs to be sloped to the knockout drum so that moisture does not stay in the line, causing freezing or corrosion problems. In many cases, the discharges from the relief valves are tied into this line. Any moisture that should happen to stay in the discharge port of the safety valve will cause corrosion of the relief valve spindle to the point where the relief valve may seize and not function when required.

The flare stack itself should be checked regularly for signs of

corrosion and metal deterioration due to high temperature from possible flame impingement. Material selection for the construction of flare stacks is important. The flare pilot should be checked to ensure that it will be dependable.

Flare systems should not be used as liquid collection systems. Many times these liquids are corrosive. If the flare system tends to gather large amounts of liquids, then the flare knockout should be coated to protect it from corrosion.

There is always the question of personal protective equipment whenever working on gas and oil facilities. Personal gas monitors and working in pairs are both important considerations.

Remember that any restriction in the flare line or flare stack may cause overpressure of the system, to the point where gases could be released from the flare knockout drum or anywhere else in the system. Also backpressure in the system could affect the operation of the relief valves that are discharging into the flare line. ❖

ABSA UPDATE SEMINAR October 5 - Edmonton / October 7 - Calgary

Once again, ABSA is offering a seminar for the pressure equipment industry to address the impact of the most recent ASME Code changes on designers, quality control inspectors and other users of the Codes. The 2004 ASME Boiler and Pressure Vessel Codes are about to be published and will become mandatory on March 31, 2005.

The meetings have been set for October 5 at the Nisku Inn in Nisku, and October 7 at the Blackfoot Inn in Calgary.

As before, we will take the opportunity to discuss other items of interest such as findings from recent design reviews or ASME shop reviews.

As seating may be limited, we would request that the number of attendees from any one company initially be restricted to two. More openings may become available closer to the meeting dates. Registrations will be accepted on a first-come, first-served basis. Applications may be obtained from your nearest ABSA office or from our website. The deadlines for registration will be September 28 for Edmonton and September 30 for Calgary. ❖

Have you visited us on the Internet yet? - www.absa.ca

SPECIAL CONSIDERATIONS FOR ALTERNATIVE LEAK TESTING FOR "CLOSURE WELDS" OF PRESSURE PIPING FABRICATED TO ASME B31.3

In a previous article (*Testing Pressure Piping*, Volume 2, Issue 4, August 1997) we explained the regulatory requirements for pressure testing piping systems, as well as some of the considerations for alternative testing or waiving of the hydrostatic test. This article provides more information about alternative leak testing. We also explain the application in Alberta of special provisions for closure welds published in the ASME B31.3.

Leak testing of pressure piping systems is performed prior to placing the system in service. The purpose of the leak test is to verify the integrity of the piping system. The test is the last physical quality test in the fabrication process to verify the system is safe to operate.

The hydrostatic test method is preferred mainly due to safety considerations and for ease of finding leaks. Hydrostatic testing is required by regulation and by B31.3, unless specific approval to use another type of test procedure or to waive the leak test has been accepted by ABSA and the Owner. Compared with air, water at ambient temperature has less stored energy per unit of volume at equal pressures. Should a component fail during a hydrostatic test, the energy stored in the water is quickly dissipated. Conversely, in view of the considerable stored energy involved with air testing, the consequence of failure of a system under a pneumatic test can be significant.

It is recognised that there may be occasions when it is impracticable to conduct a hydrostatic test. Therefore, Alberta regulations allow for, and ASME B31.3 provides, alternatives. Alternative test methods include pneumatic testing and sensitive leak testing. Certain conditions must be satisfied if an alternative test is to be used in lieu of the required hydrostatic test:

- there must be valid technical justification for selecting an alternative test. For example, if water would contaminate the process,

- a written test procedure must be prepared to address fully the technical and safety considerations for the test,
- the owner of the piping system must review the circumstances and decide to accept the risk of not hydrostatically testing the piping system,
- an ABSA SCO must have an opportunity to review and accept the proposed written alternative test procedure prior to testing, as required by Sections 58(3) and 7(2)(f) of the *Design, Construction and Installation of Boilers and Pressure Vessels Regulations*.

In addition to the listed alternative test methods, ASME B31.3 includes provisions for exempting certain welds from the required leak test. Paragraph 345.2.3(c) states:

*"Closure Welds.
The final weld connecting piping systems or components which have been successfully leak tested in accordance with para. 345 need not be leak tested provided the weld is examined in-process in accordance with para. 344.7 and passes with 100% radiographic examination in accordance with para. 344.5 or 100% ultrasonic examination in accordance with para. 344.6".*

As with the alternative leak test procedures discussed above, use of this exemption in Alberta requires specific acceptance of the written procedure by an ABSA Safety Codes Officer. The company responsible for construction of the pressure piping system must request acceptance prior to construction. Requests are reviewed by ABSA on a case-by-case basis. The review includes verification that all Code requirements will be satisfied, and that the ultimate owner is in agreement with the proposed alternative.

In-process examination in accordance with B31.3 para. 344.7 necessitates that there be accept-reject criteria established for the things that are being examined. Unlike RT or UT, such criteria have not been

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Company Annual Renewal of Power Engineering Certificates of Competency

In 1994, the annual renewal of Power Engineer and Operator Certificates of Competency came into legislation in the Engineers' Regulations and that requirement continues in the Power Engineers Regulation (AR 85/2003). Power engineers are responsible for the renewal of their certificates. Plant owners are responsible for ensuring that the requirements of the Act and regulations are met including that the power engineers are holding valid certificates. Some companies set up a group renewal with ABSA and pay the annual renewal fee for their employees.

ABSA has changed the process for company renewals and the new process is as follows.:

Annually, a company may initiate renewal of their employees' certificates by providing, to ABSA, the following information on ABSA Form AB-73 (Annual Renewal of Engineers and Operators Certificates) for **each** employee :

- File Number
- Name of Employee
- Date of Birth
- Class of Certificate
- Certificate Number
- Home Address
- E-mail address
- Signature of Employee

ABSA will accept renewals for a maximum of 3 years in advance. The renewal cards will be sent to the individual. The certificate holder is responsible to post the card with his/her certificate at the plant. ❖

CORRECTION

Volume 9, Issue 2, June 2004
"Incident Involving Over-Pressure"

Under the 3rd paragraph "..... plant air at over 100 psig (1034)kPa to the tank" should read "..... plant air at over 100 psig (**689 kPa**) to the tank" ❖

PRESSURE PIPING CONSTRUCTION DOCUMENTS

Despite their being in use for many years, questions still arise about the use of Construction Data Report for Piping Systems forms (ABSA form AB-83) and the Completion of Construction Declaration forms (ABSA form AB-81). Here are some common questions.

Who completes the forms?

AB-83 forms are to be completed by the contractor and delivered to the owner.

AB-81 forms are to be completed by the person responsible for the construction, installation, testing and inspection of the pressure piping system and forwarded to the Administrator/Chief Inspector.

What is the purpose of the Construction Data Report for Piping Systems (AB-83)?

The purpose of the AB-83 document is to provide assurance that pressure piping has been constructed, tested and inspected in accordance with the contractors quality system, engineering design, construction code and Safety Codes Act requirements.

When is the AB-83 to be completed?

A construction and test data report

form is to be completed by the contractor when the final pressure test specified in the engineering design has been completed.

What if the contractor is only building part of the piping system?

In the case of piping spools fabricated by third parties (subcontractors) and shipped to the job site for assembly and testing by the primary contractor, and no pressure test has been specified in the engineering design (to the subcontractor), then the AB-83 would be completed as a "partial data report" by the subcontractor when the subcontractor's work is complete and provided to the primary contractor. The primary contractor would then sign off a "final data report" when the final pressure test specified in the engineering design has been completed.

What is the purpose of the Completion of Construction Declaration (AB-81)

The purpose of the AB-81 is to provide assurance the system is safe to operate. This means not only that the system has been constructed, inspected and tested in accordance with the engineering design, thus deemed safe to be placed under

pressure, but also that the necessary controls, instrumentation and safety devices have been installed and verified as functional to maintain the conveyed fluid within safe operating parameters.

When is the AB-81 form to be completed?

The AB-81 is to be completed before the pressure piping system is put into operation.

When is a pressure piping system considered to be "in operation"?

A pressure piping system is "in operation" any time it is being used to convey, for any purpose, an expansible fluid under pressure after the final pressure test specified in the engineering design has been completed.

What happens to the completed forms?

The owner must retain completed AB-83 the forms on file for a period of not less than 5 years and produce them on request of a Safety Codes Officer. Completed AB-81 forms are retained on file by ABSA. Copies of these completed forms must also be maintained in accordance with the contractors quality system. ❖

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established by Code and must be realistically established by the designer. Note also that para. 342.2 states "For in-process examination, the examinations shall be performed by personnel other than those performing the production work." That is to say that the welder cannot assess his own fit-up, etc.

Pressure piping systems can present a very significant safety hazard so it is extremely important that their design, construction, installation, operation, inspection and testing be carried out in strict accordance with recognized standards. When considering any alternative to the hydrostatic test prescribed under the Safety Codes Act, all risks and consequences must be carefully and thoroughly evaluated. ❖

CHANGES TO THE INFORMATION BULLETINS WEB PAGES

The Information Bulletins web pages (www.absa.ca / Technical Information) have been revised to provide clearer information. We have categorized the bulletins and identified the bulletins that are outdated or are no longer relevant. The information bulletins have been categorized into six (6) types: Alert, Directive, Exemption, Information, Interpretation and Variance. As well, where applicable, related regulations are identified.

In addition, the Act and Regulation web page will be revised to reference the applicable information bulletins. This page is a good resource to check whether you are using the latest regulation and also to see if there are any variances that can apply to a specific regulation.

Background

The Chief Inspector and Administrator issues Variances, Directives and Interpretations regarding pressure equipment under the Safety Codes Act.

Since 1998, a total of 42 Variances, Directives, Interpretations, Alerts and other information were issued as Information Bulletins. Some Information Bulletins are outdated or are no longer relevant due to changes in the Act and Regulations, ASME Codes, or other codes and standards. People have difficulty identifying which Information Bulletins are still valid and associating them with the applicable regulations.

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ABSA is committed to providing information

Effective communication between the public and ABSA is essential to promote pressure equipment safety.

ABSA is committed to providing the latest information regarding pressure equipment safety to the public. To help us to serve you better, you can provide your feedback and suggestions to ABSA by emailing webmaster@absa.ca. ❖

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Please note that our St. Paul office has been closed. All services will be provided through the Edmonton Office.

Internet address
<http://www.absa.ca>

PRESSURE EQUIPMENT SAFETY TRAINING

As the pressure equipment safety authority, ABSA is committed to helping individuals and industry meet their training needs in pressure equipment safety. ABSA currently hosts seminars by the National Board of Boiler and Pressure Vessel Inspectors and provides seminars, with the use of ABSA subject specialists, on topics such as the upcoming Pressure Equipment Safety Legislation Seminar on October 26th and 27th. For course information and upcoming training inquiries, please see our listings on the absa.ca website.

We are developing the ABSA training page to be introduced with our redesigned website, and will be including an industry needs

assessment on the training page. Industry and individual input is critical to identifying training requirements and we value your comments and feedback. To put forward ideas for future training, to contact us for customized training sessions or if you have any concerns with regard to training, please contact the training department at training@absa.ca.

Please indicate if you or your company would like to be included on our electronic mailing list to be notified of upcoming seminars and training programs. Keep watching The Pressure News for announcements from the training department, and look for the revamped website launch! ❖

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