



The Inspector

Volume 16, Issue 2

Fall 2009 Issue

Editor: Matt Keenan
715-648-5000

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A WORD FROM OUR PRESIDENT

By: Dave Homan:

Plans are well underway for Industry Days April 2010. Our 2009 event in Milwaukee was a nice success. I would like to thank all of the members of the WBIA Board of Directors for their work to make these events worthwhile and successful for inspectors, engineers and tradesman. The time they contribute is what makes our organization a success.

Our 2010 event is in the process of being finalized, but it is a sure thing to let you know that our main speakers will be from the National Board. Once we have a contract with the hotel, we will publish a detailed schedule for our annual two day event.

Our website has been given a new face. The site is becoming more of a useful reference stop and a place you can add to your favorites, which provide links to the many other sites used in our work. Please take a few minutes to check it out: www.thewbia.com. If you would like to see specific content added to the site, please let our webmaster know. He can be reached at:

webmaster@thewbia.com.

Photos of incidents and conflagrations are always a welcome addition. Even a good sea story related to our work can be added.

If you have recently moved or changed employers and your postal or email address has changed, please take time to drop us an email with your updated contact information.

In closing, the purpose of our organization is to provide continuing education credits to those who need them in maintaining their Wisconsin credentials. If you think of a topic related to our field, that you would like to see at a future Industry Days event, please let me know. We are here to serve you and the people of Wisconsin in maintaining public safety in the boiler and pressure vessel community. Your input is valuable and appreciated. My phone number is 262-880-6864.

My email address is:

drhomanjr@yahoo.com. I look forward to hearing from you.

**6th Annual Boiler Industry Days
April 2010
Week of April 12, 2010**

Come One Come All.

Presentations by The National Board of Board and Pressure Vessel Inspectors.

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IMPORTANT

Continuing Education Requirements for All National Board Commissioned Inspectors Started in 2005!

Attending the WBIA Seminars helps you meet these requirements.

The Chief's Words:

By: Mike Verhagen, Chief Boiler Inspector



During the summer I have been toiling around the house gardening, cutting my lawn, assisting my son fix things at his newly purchased home, repairing my Dad's TV antenna, took a vacation riding the Harley completely around the perimeter of Lake Superior and eventually caulking and applied a fresh coat of paint on the deer shack up north. I even forced an occasional fishing trip with my wife in our busy summer schedule She makes the best fish fry anywhere. Since summer has come and gone so quickly, I am now making preparations for school, hunting and other fall / winter activities. Although at this writing Wisconsin temperatures remain comfortable, the heating season is fast approaching so get those furnaces and boiler cleaned - tuned up for the season ahead. Was a fantastic summer for me and hope yours was equally enjoyable.

Department News

Not much to report. Everything is electronic, computerized and automatically processed in Madison. It's a normal routine in and around Waukesha to write correspondence, answer email and return telephone calls. Numerous petitions, Gas System plans, business meetings, training development and code revisions for Comm 45, Mechanical Refrigeration have kept my nose to the grindstone. This summer I have enjoyed a slight increase in the number of visits from inspectors, contractors and clients who conveniently stopped at the office. My doors are always open and welcome visitors for consultation during regular work hours.

Commerce Website:

Our Commerce website is a wealth of knowledge for our industry. Check out the specific "program" for applicable brochures, forms, applications, codes, group lists and equipment detail. Don't miss our new WBIA website which includes boiler links for educational as well as historical information and connection to contacts in the Midwest.

Department of Commerce, Safety & Buildings Division

<http://www.commerce.wi.gov/SB/>

Credential Check Or call @ 608-261-8467

http://apps.commerce.state.wi.us/SB_Credential/index.jsp

Boiler pressure vessel Search

http://apps.commerce.state.wi.us/SB_ServiceAgent/SB_RegObjMain.jsp

Wisconsin Boiler Inspectors Association

Try this new Boiler and Educational Link Creation

<http://www.thewbia.com/>

Got questions? Get answers ! Before meeting with your customers, completing boiler installations, repairs, or inspections, a contractor and inspector may utilize the available information from our website. One can search and print specific boiler data, credential status, registration forms, and obtain codes and brochures. Check out our informational program brochures titled:

Boiler -Pressure Vessels,

Gas Systems & Anhydrous Ammonia,

Historical – Hobby Boiler

and Mechanical Refrigeration brochures which can be great "question and answer" handouts for your customers. The latest addition to our list of brochures is the

Solid fuel-fired water-heating Appliances.

All are available on the "Commerce - Safety and Buildings " site under the specific program. Just click and print !

Boiler Inspector Credential Comm 5.60:

Comm 5.60 Boiler–pressure vessel inspector. (5) RENEWAL. ..
CODE SECTION REMINDER

(a) A person may renew his or her certification as a boiler–pressure vessel inspector.

(b) A boiler–pressure vessel inspector certification shall be renewed in accordance with s. Comm 5.07.

(c) 1. The renewal of a certification as a certified boiler–pressure vessel inspector which has an expiration after December 31, 2008, shall be contingent upon the boiler–pressure vessel inspector **obtaining at least 24 hours of acceptable continuing education** within the time period specified in s. Comm 5.08 and Table 5.06, except as provided in subd. 2.

2. A person who holds a certification as a certified boiler– pressure vessel inspector may apply to the department for waiver of the continuing education requirements under subd. 1. on the grounds of prolonged illness or disability or similar circumstances. The department shall consider each application for waiver individually on its merits.

3. A person who initially obtained his or her boiler–pressure vessel inspector certification by providing evidence of having passed the competency examination by the National Board and whose request to renew his or her certification is denied because of the failure to fulfill the continuing education requirements of subd. 1., shall be required to take and pass the competency examination in order to reacquire the boiler–pressure vessel inspector certification.

Department News:

By: Rick Merkle, Section Chief Safety & Buildings

I want thank our State Inspectors, State Contractor (Damarc), City of Milwaukee (Boiler Program) and our Service Agents for doing a tremendous job on keeping up with there work loads and keeping the over dues down to a minimum for this quarter, ending September 10, 2009. You managed to bring the numbers down for Boilers and Pressure Vessels from 3.6% to 2.5%...TREMENDOUS JOB! I would like to see us achieve less then 2.0% over dues for the next quarter for December, 2009. The state will be pursuing anything that is 90 days over due...please make every effort to get to the locations that you have as a customer or contract that have over dues.

I have sent out notices recently to all Service Agent Supervisors regarding the Boiler and Pressure vessel installation registrations form SBD-6314. We need everyone's help in getting these forms back to the department, this is only way we know that an inspection has taken place. If you find that a boiler or pressure vessel was installed without the registration form please write up the violation to the owner. We need all the HVAC contractors compiling with Comm 41.41. Education and then enforcement is always the best method. When I'm made aware that a HVAC contractor fails to register boiler/pressure vessels, I contact them directly myself and discuss the matter. So, if you know of contractors continuously violating this rule, please let me know by dropping me a line or call me.

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We are still having problems in getting correct owner information, owner address and address locations being reported or in error. With EDI, we all have the current address the state has on the database records, so please take the extra minute to research or ask the owner to ensure you are providing the correct information prior to electronically submitting your report.

Your help in these matters above will enhance the efficiency of our Inspection Support Staff during processing.

Thanks for a great summer and see you all in the spring training...remember you need 24 hours of Continued Education credits in your 4-year cycle.

Best Regards,

Rick Merkle
State of Wisconsin
Section Chief, Division of Safety and Buildings
Bureau of Integrated Services
201 West Washington Ave. PO Box 2658
Madison, WI 53701-2658



12 killed in Bangladesh Boiler Explosion

Comm 2, Fee changes:

In the very near future, your customers may question the "Permit to Operate" PTO fees received from our Department. Therefore, all should know and be aware that the boiler and pressure vessel "Permit to Operate" PTO fee will be increased from 35.00 to 50.00 for each PTO issued. Current PTO fees for boilers are found in Chapter Comm 2.11(6). In addition to boiler and pressure vessels, the PTO fees for elevators and refrigeration equipment were also increased. Visit our website for more info and detail of the hearing process held in August 2009.

Thanks:

The statistical numbers show that all inspectors are doing well to reduce the over-due boilers and pressure vessels. Supervisor Rick Merkle does a fantastic job getting the detail info out to all service agencies and expects that each inspector and contractor consistently verify accurate data and update/ their equipment lists / inspection reports frequently. Due to the consistent efforts of each individual inspector working in Wisconsin, the Boiler Safety statistics are the best in the Department. I am extremely proud of our work to assure boiler safety in Wisconsin and provide numbers to prove it. Thanks again to all for keeping up our great track record.

ANNUAL SPRING TRAINING

National Board instructors are tentatively planned to provide 2 full days of days of training for Wisconsin's 6th Annual "Boiler Safety Industry Days" scheduled **April 12-16, 2010** mark your calendar !

Together, the WBIA, National Board and Department of Commerce are planning for our 6th ANNUAL BOILER SAFETY - INDUSTRY DAYS to be held 2 days during the week of April 12-16, 2010. Attendees may obtain continuing education credits to maintain their Comm 5 qualifications. Training topics will cover both contractor and inspector related issues so plan ahead and tentatively mark your calendar for the week. Later this year, the WBIA Board members will select (2) days during this week based on the hotel & location with more specific info to follow after we finalize negotiations. With your calendar already marked as requested above, I look forward to your attendance!

DEPARTMENTAL CORRESPONDENCE

Mail correspondence to:

Department of Commerce Safety and Buildings Div/Inspection Support
PO Box 7302
Madison WI 53707-7302

Email to Order Supplies:

materialorders@commerce.state.wi.us

Waukesha Boiler Safety office telephone and address:

Mike Verhagen, Department of Commerce
Safety & Buildings Division
141 NW Barstow St., 4th Floor
Waukesha WI 53188

Email: mike.verhagen@wi.gov

262-548-8617

When in the Waukesha area, you are invited to stop by my office to visit and say hello but recommend if important business concerns are expected, please call in advance so I can make preparations & assure that I am actually in the office when you arrive.

My office hours are Monday –Friday, 8:00 to 4:00 PM and always available to answer questions via telephone, email or regular US mail. When I am out of the office, you may contact the state District Boiler Inspector of your area, Section Supervisor, Rick Merkle @ 608-266-3037 / rick.merkle@wi.gov or Program Manager, Joe Hertel @ 608-266-5649 / joe.hertel@wi.gov

Thanks for your continued support and cooperation.

WBIA WEBSITE

THEWBIA.com

The WBIA operates a website and you should take a look at what it can do for you! The Jurisdiction Section allows you access to Codes and Search engines for eight different States. Our Newsletter back issues and Seminar information is available a click away. We also link to all ASME/NB forms and every important Organization having Boiler and Pressure Vessel information. More links coming daily. Our website is easily usable from your Blackberry or other hand held devices. You are always near the information you need! Try it! Tell Others about it.

Thought of the Day

**"I'm so busy, I don't know if I found a rope,
or lost a horse!"**

What is a BPRV & RPRV?

By: Matt Keenan

When I first became aware of these devices I knew it had something to do with the relief valves. But what you may ask are they? Why are these so different from what we are use to? Well they stand for Rupture Pin Relief Valves and Buckling Pin Relief Valves. Not something we are normally discuss or see in our work. So what is this technology and where did it come from?

Well we know that some of the first pressure relief devices were developed around the 1750's. These came about because of the invention of the steam engine. These devices used weighted metal plates to control lifting pressure of these first relief devices. About the 1850's we were seeing higher pressure and the first spring loaded pressure relief devices showed up. Then around 1910 an inexpensive device was design, the rupture disc. After that the pilot-operated valve came into being around 1954. Since then not much had changed with relief device until around 1986 when a couple of oil companies went to a gentleman, Julian Taylor, to help solve a problem with the pilot-operated valves. Pilot-operate-valves had a tendency to fail to operate as designed about 5% of the time.

Both rupture pin and buckling pin valves are used for relief and emergency shutdown situations at some set point. These are self contained, self actuating type devices are suppose to be very accurate. They use a slender round pin that is designed to obey Euler's law of Compressed Columns which depends on the dimensions of the pin and material of construction of the pin.



So who is this Leonhard Euler? Leonhard Paul Euler lived from 15 April 1707 – 18 September 1783. He was a pioneering [Swiss mathematician](#) and [physicist](#) who spent most of his life in [Russia](#) and [Germany](#). Euler made important discoveries in the fields of [calculus](#) and [graph theory](#). He also introduced much

of the modern mathematical terminology and notation, particularly for [mathematical analysis](#), such as the notion of a [mathematical function](#). He is also renowned for his work in [mechanics](#), [fluid dynamics](#), [optics](#), and

[astronomy](#).

Euler is considered to be the pre-eminent mathematician of the 18th century and one of the greatest of all time. He is also one of the most prolific mathematicians.

Euler's Law of Compressed Columns determines the buckling point of the pin. It states the axial force causing the pin to buckle is proportional to the pin diameter to the fourth power times the pin material Modulus of Elasticity divided by the pin length squared. By using Euler's Law, the pin's diameter and length can be determined, and the set point accurately predicted, every time. In order to keep pin dimensions precise and insure set point accuracy, we control the pin diameter to five decimal places and the length to four decimal places. The modulus of elasticity of the pin material is the only variable affected by ambient temperature. Using materials that have a very minimal change in modulus of elasticity over the ambient temperature range of the valve exterior solves this challenge. One pin alloy used has a modulus of elasticity variation of .3% over a temperature range of -200°F to +400°F. Because the pin is in compression and always below its elastic limit, pulsation is not a factor and the pin can never fatigue. Since the pin is external to

Euler's Law of Compressed Columns

Euler's Law determines the buckling point of the Pin.

$$\frac{\text{Axial Force on the Pin Causing the Pin to Buckle (Piston/Plunger Area} \times \text{System Pressure)}}{\text{Pin Diameter}^4 \times \text{Pin Material Modulus of Elasticity}} \sim \frac{1}{\text{Pin Length}^2}$$

the system fluid, pin corrosion is not a concern. The ambient environment is no problem since the pin is made of non-corrosive alloys.

There are very few limitations to valve sizes or set points. Pressure set points can be set as low as 1 psi to as high as 50,000 psi and vacuums as low as 1 psi. Buckling Pin valves can be designed to effectively handle corrosive and dangerous fluids and gases with no environmental concerns, because the systems' integrity is not compromised when resetting the Buckling Pin Valve. Buckling Pin valves can be made of special alloy materials, plastics or have glass lining to meet special requirements. The valves may also be equipped with a proximity switch to alert a remote operator that the valve has closed. The replacement pins can be stored at the valve. The Buckling Pin valve can also have multi-action capabilities by using 3-way or 4-way ball valves instead of piston or plunger valves.

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|----------------------------------|--------------------------------|
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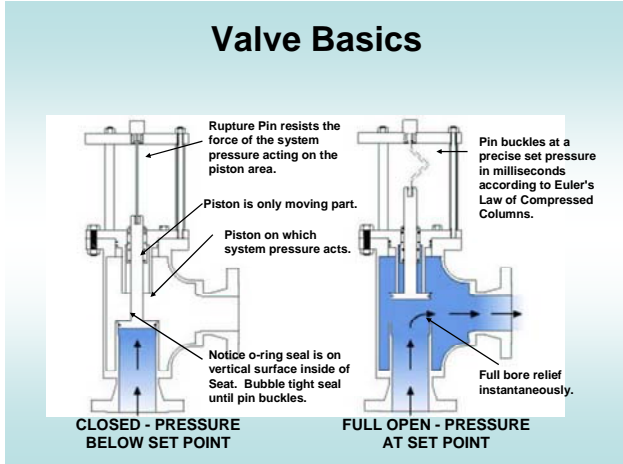
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What is a BPRV & RPRV?

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Did You Know!

Valve Basics



These valves are recognized and discussed in many of the International Standards. The ASME discusses this in a Code Case, Code Case 2091. The API discusses this in RP-520, Part 1- Section 2.4. The TUV AD Merkblatt A1 and the European Pressure Equipment Directive (PED) also cover these devices.

Certification tests are done on all valves before they are put in service. The ASME standard calls for set point variation of $\pm 5\%$. Many of the valves achieve $\pm 1\%$ and rarely exceed a deviation above $\pm 3\%$ from set point. Pins are tested on to determine a load vs time curve independent of valve seal friction.

How do we maintain these types of valves?

There are two ways to check the piston movement. Valve Maintenance consists of:

(1) Remove the pin and apply pressure to the valve of no more than 10-20% of the set point. If the piston moves, the valve is in good shape.

(2) To test under pressure, turn the pin holding nut one turn, no more. If the piston moves, the valve is reliable. Tighten the holding nut. You are now assured of opening at set point. The pin is never a concern. It obeys Euler's Law. If the piston does not move, remove the top assembly by loosening the bonnet bolts.

(The top plate should never be removed). Remove the piston and replace the elastomer seals; reassemble and reset the Pin. Check to make sure the pin is not damaged or bent by rolling on a flat service, the pin will have an infinite life if not damaged or bent.

160 billion emails are sent daily, 97% of them are spam.

Spam generates 33bn KWh-hours of energy every year, enough to power 2.4 million homes, producing 17 million tons of CO₂.

9 out of every 1,000 computers are infected with spam.

Spammers get 1 response to every 12 million emails they send (yet it still makes them a small profit).

There are some 1 billion computers in use.

There are some 2 billion TV sets in use.

There are some 3 billion cell phones in use.

About 3 million cell phones are sold every day.

The first known cell phone virus, Cabir.A, appeared in 2004.

Since 2008, video games have outsold movie DVDs.

About 1.6 billion people connect to the internet,

450 million of them speak English.

Google handles about 1 billion search queries per day.

The average US household uses 10.6 megawatt-hours (MWh) electricity per year.

10 hours of video viewing is uploaded every minute on YouTube.

On average, US onliners view 100 videos per month each.

Retirees

Anyone knowing of inspectors retiring please inform us so we can get their names in this Newsletter.