

WARE

ALL WAYS STEAM



THE GRIME

Better Safe Than Sorry by Alex Taylor, National Account Rep

With current engineering and manufacturing quality being much higher and more consistent than any other point in human history, it can be tempting to fall into a habit of neglecting inspections and delaying repairs of unfired pressure vessels. However, it is imperative to remember that while they may not require as much caution and daily attention as a boiler, auxiliary tanks filled with heat and pressure are still dangerous and have the capacity to cause serious damage, injury, or death. Unfortunately, on April 3rd, 2017, this fact was proven in a most tragic way at the Loy Lange Box Co. in St. Louis, in which four lives were lost in an explosion. A pressurized condensate receiver tank about the size of a full-size van exploded, killing one of the facility's engineers who was nearby, and injuring several other employees. The 2,000 pound vessel launched 400 feet vertically through the roof, was airborne for approximately 10 seconds, then crashed through the roof of Faultless Healthcare Linen, another local business that was about 500 feet down the street. Three people were killed when the tank landed—for two of them, they were there for their first day of work at the company.

The tank in question had been inspected in 2012, and heavy corrosion was discovered in the bottom, so a patch was made. A month later, the company that made the patch repair came back and recommended replacing the entire lower section of the tank due to the extent of the corrosion, but this was not done. On March 31st, 2017, engineers found a new leak and saw that the bottom of the tank had some severe corrosion; a repair crew was scheduled for April 3rd—the date of the explosion—and the system was shut down. On the morning of the scheduled repair, the system was brought back on-

line before the repair crew had a chance to fix the tank, and the rest, as they say, is history.

There were many points along the way where this travesty could have been avoided--the company could have scheduled repairs to the pressure vessel sooner, the city could have performed more frequent inspections and forced the company to repair the equipment or shut it down, etc.—but make no mistake: it was avoidable. Some anonymous whistle blowers have since claimed that the local inspectors may not be inspecting everything in the city as frequently as they should. This might be due to lack of manpower or faulty practices; regardless of the cause, if this is true, then it is up to businesses to self-regulate and make ensuring safety their responsibility. Think about your own facility: are there scheduled inspections—both internally and from your city, state, or certified insurance inspector? And if you do have those inspections, how often do you act upon the inspections' findings to make the appropriate repairs?

In the case of Loy Lange Box Co., there are multiple pending lawsuits for wrongful death, Worker's Compensation claims for injured employees, as well as local and federal investigations by OSHA, CSB (Chemical Safety & Hazard Investigation Board), and others. When dealing with your facility's equipment, it is essential that you respect the power it can harness and the potential consequences that can result from failing to properly maintain and operate it. With any pressure vessels—either fired (like boilers) or unfired (such as deaerators, pressurized condensate return or surge tanks, etc.)—be sure to regularly inspect them, even if your regulatory authorities do not. If you see something suspicious or concerning, report it to your supervisor or manager and emphasize the safety risks that may be associated with it. If, however, you do not have the expertise or are unsure if there is a serious problem with your equipment, either schedule a certified inspector to take a look at it or call a professional company like WARE to check it out. When it comes to boilers and pressure vessels, it is as they say, "better safe than sorry."



The WARE Guide to Your Annual Open and Close Inspection

The WARE Guide to Your Annual Open and Close Inspection

Your boiler needs more attention than you think.

It's easy to believe your boiler is a part of your facility that should work with little upkeep. But that's not true.

Just like your body needs an annual check-up at the doctor, your boiler needs an annual check-up too.

It's called an Annual Open and Close Inspection.

Your inspector is provided by your insurance carrier. Insurance carriers warranty damage that doesn't result from negligence (much like your car). A subpar inspector may not require you to open everything. This might be expedient, but it doesn't help you in the long run.

Boilers 15psi or more must be inspected once per year. These are called high-pressure units, and they are generally found in manufacturing facility that use process steam.

Boilers lower than 15psi are inspected once every two years. These systems are generally used for heating and found in schools or office buildings.

Here's why your boiler's Annual Open and Close Inspection is important:

Standard boiler use can cause buildup or scale if water

treatment is not maintained. If you don't perform an annual inspection, you won't know the extent of the buildup or the potential damage done to your boiler through normal use.

Scale buildup costs you money. Just to give you some perspective, 1/8 inch of fireside scale buildup equates to about 47% heat loss. And, even as little as 1/32 inches of scale in tubes equals a 2% increase in fuel consumption. Again, this adds to the cost of running your boiler.

Not having an annual inspection puts you at increased risk for a

potentially catastrophic failure. Boilers explode because the low water trips are unable to identify low water condition—a problem easily identified in an Annual Open and Close Inspection.

Quick tip: If you perform a blowdown on your boiler system once per day or once per shift, you will drastically reduce the amount of sediment buildup in your boiler, and your risk of catastrophic boiler failure as a result.

To get ready for your inspection, remove everything on the fireside and waterside of your boiler.

Your boiler service company should...

- ▶ Open both the fireside and waterside of the boiler.
- ▶ Make sure the refractory is intact.
- ▶ Inspect the tubes and the tube sheet.
- ▶ Look for scale in waterside tubes, the control line, and the McDonnell Miller Bowl. (Scale is formed from too much chemical and not enough blowdown.)
- ▶ Look in the hand holes to identify any scale or pitting on the tubes.

After you get your clean bill of inspection:

- ▶ Put new gaskets on the fireside, waterside, handholes, and manway of the boiler.
- ▶ Put caps, crosses, and the McDonnell Miller Head back on.
- ▶ Fill the boiler with water and get it ready for a test fire.

When you test fire the boiler:

- ▶ Check the tuning of the burner.
- ▶ Check the O2 levels for proper combustion.
- ▶ Check the safeties to make sure they're functioning properly.
- ▶ Inspect the pressure controls to make sure they're working correctly.



WAREboilers
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- Annual Steam Boiler Open and Close

An Annual Open and Close Inspection can help you identify problems that put you at risk for revenue loss or catastrophic boiler failure. Follow the tips above to make sure your inspection runs as smoothly as possible.

How to Use Tricocks to Measure Boiler Water Level

Most of the time, your boiler's sight glass works perfectly.

But sometimes, it's hard to tell whether the glass is reading empty or full.

The problem gets especially scary when you consider the consequences of improper water level in a boiler.

Too much water leads to overfilling, where your steam system gets flooded with water, creating hydraulic shock and damaging your steam system. But that's not the worst of it...

Too little water leads to heat exchangers overheating and—at best—becoming severely damaged, and—at worst—causing an explosion if water is added.

And, if you don't know your water level, you'll need to shut your boiler down to verify it.

So, what should you do if your sight glass isn't working?

Use your tricocks!

Here's what you should expect to see from each different valve:

Top Valve

The top valve should produce pure steam. There should be little to no moisture content.

Center Valve

The center valve should produce pure steam initially, but should expel water afterwards.

Bottom Valve

With the bottom valve, you should expect high moisture content immediately. You will get some steam, due to the fact that heated water in the boiler will flash into steam as it comes out.

Once you've got an idea of whether your water

level is too low or too high, you'll be able to determine your next action with confidence.

If you don't have tricocks on your boiler, we recommend installing them. Simple tricocks cost between \$17.12, which means the entire installation process can cost less than \$100. That's a low price to add another level of safety.

If you have older tricocks and are unsure about their condition, you're better off replacing them than trying to salvage the ones you have. Older tricocks are often difficult to open and re-close. Use your tricocks frequently to avoid having them lock up and become difficult to use.

And, since you'll be exposed to steam when you check the tricocks, make sure you wear the right protective equipment.

The best part about using tricocks? It's easy! Just follow this guide, and enjoy adding another level of control to your boiler system.



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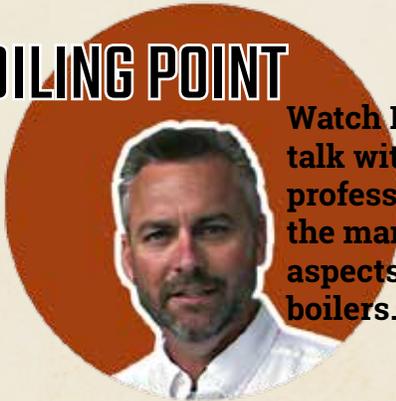
WATCH JUDE WOLF ON THE BOILING POINT EXPLAINING HOW TO USE THE TRICOCKS ON A STEAM BOILER

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BOILING POINT



Watch Ritchie talk with industry professionals about the many different aspects of steam boilers.



STEAM CULTURE



Every Friday, Brent will talk about where steam and Culture intersect.

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**BREATH
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Videos are informational and fun involving boilers, chillers, burners and more from an industry leading boiler company.



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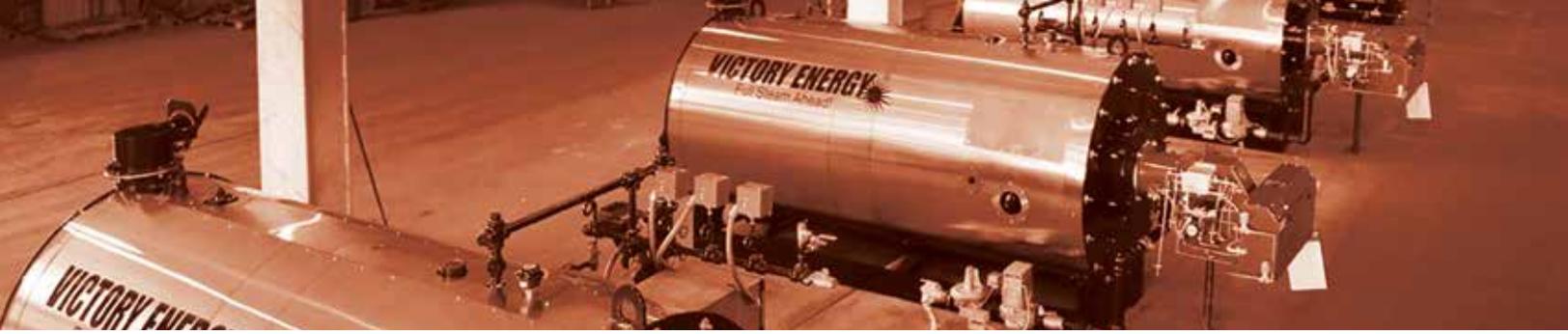
NEW AND USED LIST

ALL EQUIPMENT LISTED IS FOR SALE OR LEASE AND SUBJECT TO AVAILABILITY

| Unit | HP/PPH | Year | Manf. | Fuel | Type | PSI | Ctrl. |
|-------|--------|------|------------------------------|----------------|----------|---------|----------|
| 779 | 82,500 | 2013 | Victory Energy Limpsfield | (Low NOx) G/#2 | Steam | 350 | IRI |
| 796 | 82,500 | 2016 | Victory Energy Faber | (Low NOx) G/#2 | Steam | 350 | IRI |
| 797 | 82,500 | 2016 | Victory Energy Faber | (Low NOx) G/#2 | Steam | 350 | IRI |
| 767 | 75,000 | 2011 | Victory Energy | (Low NOx) G/#2 | Steam/SH | 750/750 | IRI |
| 747 | 75,000 | 2000 | B&W | (Low NOx) G/#2 | Steam/SH | 750/750 | IRI |
| 791 | 75,000 | 2016 | Victory Energy | (Low NOx) G/#2 | Steam/SH | 750/750 | IRI |
| 750 | 70,000 | 1996 | Nebraska | (Low NOx) G/#2 | Steam/SH | 750/750 | IRI |
| 709 | 60,000 | 1979 | Zurn | (Low NOx) G/#2 | Steam | 500 | IRI |
| 741 | 60,000 | 1979 | Zurn | G/#2 | Steam | 550 | IRI |
| 795 | 40,000 | 1986 | Cleaver Brooks | Gas | Steam | 260 | IRI |
| 496 | 800 | 1990 | York-Shipley | (Low NOx) G/#2 | Steam | 200 | IRI |
| 634 | 800 | 1972 | York-Shipley | G/#2 | Steam | 150 | IRI |
| SSB30 | 800XID | 2014 | York Shipley | (Low NOx) G/#2 | Steam | 250 | UL/CSD-1 |
| 620 | 800 | 1975 | York-Shipley | G/#2 | Steam | 250 | IRI |
| SSB28 | 600XID | 2012 | York Shipley | (Low NOx) G/#2 | Steam | 250 | UL/CSD-1 |
| SSB15 | 500XID | 2011 | York Shipley | (Low NOx) G/#2 | Steam | 150 | UL/CSD-1 |
| SB139 | 500 | 2001 | Cleaver Brooks | | Steam | 150 | |
| SB243 | 400 | 2018 | Victory Energy | (Low NOx) G/#2 | Steam | 150 | UL/CSD1 |
| SB138 | 350 | 1994 | Cleaver Brooks | | Steam | 150 | |
| SSB39 | 300XID | 2016 | Victory Energy | (Low NOx) G/#2 | Steam | 150 | UL/CSD-1 |
| SSB40 | 250 | 2017 | Victory Energy | (Low NOx) G/#2 | Steam | 150 | UL/CSD-1 |
| 415 | 250 | 1980 | Eclipse | #2 Oil | HT/HW | 954 | IRI |
| SB216 | 250XID | 2015 | York-Shipley | (Low NOx) G/#2 | Steam | 150 | UL/CSD-1 |
| SB148 | 200 | 1995 | Kewanee | Gas | Steam | 325 | IRI |
| SB146 | 200 | 1995 | Kewanee | Gas | Steam | 325 | IRI |

ONE HOUR QUOTE ON-LINE AT WAREINC.COM OR CALL 800-228-8861





NEW AND USED LIST continued

ALL EQUIPMENT LISTED IS FOR SALE OR LEASE AND SUBJECT TO AVAILABILITY

| Unit | HP/PPH | Year | Manf. | Fuel | Type | PSI | Ctrl. |
|--------|--------|------|----------------|----------------|-------|-----|----------|
| SB213 | 175XID | 2014 | York-Shipley | G/#2 | Steam | 150 | UL/CSD-1 |
| SB220 | 175XID | 2015 | York-Shipley | G/#2 | Steam | 150 | UL/CSD-1 |
| SB240 | 175XID | 2017 | Victory Energy | G/#2 | Steam | 150 | UL/CSD-1 |
| SSB20 | 175XID | 2012 | York Shipley | (Low NOx) G/#2 | Steam | 150 | UL/CSD-1 |
| SWVB1 | 1200 | 2017 | Victory Energy | (Low NOx) G/#2 | Steam | 250 | UL/CSD-1 |
| SWVB2 | 1500 | 2017 | Victory Energy | (Low NOx) G/#2 | Steam | 250 | UL/CSD-1 |
| SSB38 | 150 | 2016 | Victory Energy | (Low NOx) G/#2 | Steam | 150 | UL/CSD-1 |
| SB242 | 150 | 2016 | Victory Energy | G/#2 | Steam | 150 | UL/CSD1 |
| SB236 | 150 | 2016 | Victory Energy | G/#2 | Steam | 150 | UL/CSD1 |
| 769 | 150 | 1998 | Precision | Electric | Steam | 150 | UL |
| SB-232 | 100 | 2016 | Victory Energy | G/#2 | Steam | 150 | UL/CSD-1 |
| SB-239 | 100 | 2017 | Victory Energy | G/#2 | Steam | 150 | UL/CSD-1 |
| SSB41 | 100 | 2017 | Victory Energy | (Low NOx) G/#2 | Steam | 150 | UL/CSD-1 |
| SB-241 | 100 | 2008 | York Shipley | Gas | Steam | 150 | UL |
| SB-237 | 70 | 2016 | Victory Energy | G/#2 | Steam | 150 | UL/CSD-1 |
| SB-238 | 70 | 2016 | Victory Energy | G/#2 | Steam | 150 | UL/CSD-1 |
| SSB35 | 70 | 2016 | Victory Energy | (Low NOx) G/#2 | Steam | 150 | UL/CSD-1 |
| SB-234 | 50 | 2016 | Victory Energy | G/#2 | Steam | 150 | UL/CSD-1 |
| SB-227 | 50 | 2016 | Victory Energy | G/#2 | Steam | 150 | UL/CSD-1 |
| SSB33 | 50 | 2015 | York Shipley | (Low NOx) G/#2 | Steam | 150 | UL/CSD-1 |

| Unit | Size | Manf. | Volt. | Type | Year | |
|-------|---------|---------|-----------|------|------|--|
| RC-24 | 30 ton | Mc Quay | 480v | 3 ph | 2000 | <div style="font-size: 2em; font-weight: bold; color: #008080;">CHILLERS SECTION</div> <div style="font-size: 4em; color: #008080;">««</div> |
| RC-26 | 40 Ton | Mc Quay | 480 v | 3 ph | 1999 | |
| RC-1 | 60 Ton | Mc Quay | 480 v | 3 ph | 1995 | |
| RC-13 | 60 Ton | Trane | 200-230 v | 3 ph | 1989 | |
| RC-5 | 95 Ton | Mc Quay | 480 v | 3 ph | 1995 | |
| RC-6 | 105 Ton | Mc Quay | 480 v | 3 ph | 1995 | |
| RC-11 | 195 Ton | Mc Quay | 480 v | 3 ph | 1995 | |
| | | | | | | |

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Record Attendance at WARE's Annual Partner Event

Late motivational speaker Jim Rohn said "You are the average of the five people you spend the most time with."

What he meant was that we are who we associate with. Those people can either pull us down or lift us up.

WARE has been lucky enough to associate with some incredible people and partners. We have 27 Partner companies across the nation who act as salespeople and service personnel for our equipment throughout the country.

These relationships are what enable us to operate on such a large scale, and we are exceedingly thankful for them.

To show our appreciation, we host an Annual Partner event every year so all of our partners can travel to Louisville and enjoy a weekend of networking, food, and fun.

This year's Partner Event was held on April 20th and 21st.

For the first time since the event began in 1998, we had record attendance, 25 out of our 27 Partners were able to join us in Louisville.

On Friday, April 20, Partners toured WARE's new state-of-the-art training facility, Boiler University, as well as the maintenance facility, The Valve Shop, where they were able to see WARE's newest boiler technology and product offerings.

Friday's dinner was held at LeMoo, one of Louisville's premier steakhouses. After dinner, WARE presented Partners with this year's Sales Awards (listed below).

On Saturday, Partners attended Thunder Over Louisville—one of North America's largest fireworks shows. During lunch, former Navy Seal Sean Haggerty spoke to guests and revealed his tips for developing leadership skills.

Partners viewed the afternoon air show, featuring U.S. Army Golden Knights, as well as the Royal Canadian Air Force, from the rooftop area of the Sheraton Hotel. That evening, Partners were served dinner and viewed the fireworks show from the Sheraton's Riverside Ballroom.

Since its inception 20 years ago, WARE's Annual Partner event continues to be an educational, enriching, and enjoyable experience for all attendees. WARE is incredibly grateful for the friendship and support of all its Partners, and we're eagerly awaiting next year's Partner Event!

WARE Annual Partner Sales Awards

High Fire Award The Partner with the highest revenue

American Combustion Inc.
Glenn Dale, MD
Mr. David Grimard



Main Flame Award The Partners that reached their budget for the year

American Combustion Inc.
Glenn Dale, MD
Mr. David Grimard

L & L Boiler Maintenance
Montoursville, PA
Mr. Bruce Miller

Burner Combustion Systems
Crosby, TX
Mr. Chris Robinson

McCain Engineering
Pelham, AL
Mr. Kyle McCain

DMI-Decker Mechanical Inc.
Cedar Hill, TX
Mr. Wade Decker

PBBS Equipment Corp
Menomonee Falls, WI
Mr. Tim Carberry

Hughes Machinery
Lenexia, KS
Mr. Brad Mensendiek

Stoermer Anderson
Cincinnati, OH
Mr. Tom Schmidt

Intermountain BoilerworX
Arvada, CO
Mr. Dan Brannan

Valley Boiler & Mechanical
Roanoke, VA
Mr. Gary Jarrell

Innovative Boiler
Naperville, IL
Mr. John Kelly

Yown's Boiler & Furnace Service
Jacksonville, FL
Mr. Gary Yown

Jackson Mechanical Services, Inc.
Oklahoma City, OK
Mr. Larry Beatty

Service Award "The BULL" The Partners that have supported WARE the most over the last year

Ignition Award The Partner with the best start of the new year

McCain Engineering.
Pelham, AL
Mr. Kyle McCain

Innovative Boiler Systems
Naperville, IL
Mr. John Kelly

Top Parts Sales The Partner with the highest parts sales revenue

Hughes Machinery
Lenexa, KS
Mr. Luke Vancamp

PBBS Equipment Corp
Menomonee Falls, WI
Mr. Joey Dambroski

Top Valve Sales The Partner with the highest valve sales revenue

Troy Boiler Works
Troy, NY
Mr. Lou Okonski



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