Fall 2019 Newsletter

Don't Forget the Refractory -By Alex Taylor

When considering boiler maintenance, generally the tubes, valves, fittings, and other mechanical components will get the most attention to ensure that they are in good condition. This is often appropriate, given that they see a great deal of wear and tear. Not all critical boiler components, however, are made of metal—of crucial importance to also be considered is the refractory. In simple terms, refractory is an insulating material that is used in boilers to help keep heat in the vessel and to protect various parts of the vessel from overheating.

While there are various refractory materials available, it is most often a ceramic material. Some areas where it can generally be found are around the edges of burners, covering part or all of the rear door in firetube boilers, and along the front & rear walls or at the tube/drum connections of watertube boilers. In some boiler designs, there may even be 'bricks' of refractory in the bottom or sides of the vessel. Despite its importance to the boiler, refractory can often be neglected, and this can lead to serious problems down the road.

Regardless of the size of the boiler, its furnace area is an inhospitable place. With the burner sending a large flame into the furnace, the metal surfaces are constantly exposed to extreme heat. Since the purpose of a boiler is to transfer heat from the flame through those metal surfaces and into the water, that high heat is good for quickly bringing the water up to high temperatures… but not all parts of the boiler receive heat equally. Some areas, such as the rear door of a firetube boiler, are directly targeted by the bulk of the heat from the flame, so they require additional protection. Without that protective refractory, the metal would be unable to dissipate heat quickly enough, and it would eventually warp or melt completely. This is highly undesirable, and can completely ruin the vessel. Boilers don't just experience thermal stress from constant heat—they are also stressed by the constant heating up and cooling off that occur during cold startups and cycling on & off. The refractory has to be somewhat flexible to handle the expansion & contraction that comes with these heating and cooling cycles.

Continued on page 7

UL Code Now Requires a Manual Reset After Power Failure

-By Mike Taylor

Your boiler room will inevitably lose power at some point.

In many boiler rooms, when the power goes out and then comes back on, the boiler restarts automatically.

The NFPA (National Fire Protection Association) has long-required that a boiler be manually reset after a power failure or after a power outage to the control circuit.

But now, per UL code, if you do not have a manual reset button on the control board for your boiler, one must be installed.

If your equipment is required to be up to NFPA code, then you have always been required to perform a manual restart after a power failure.

However, if your equipment must only meet UL code requirements, then it is grandfathered in until you change something. At that point, when making a change to the system, a manual reset button must be installed on the control board.

In practice, this means that, if your boiler room loses power, causing your boiler to shut down, you cannot just let it automatically restart. Instead, it must be manually restarted. And you must make sure you have a manual reset button installed.

Keeping your boiler up to code is crucial, which is why we're letting you know about this change.

Feel free to contact us for any clarifications on this UL code change.

WAREboilers channel

Learn more on the Boiling Point "NFPA Boiler Restart after Power Failure"

One Screen to Control Your Entire Boiler Room

BY
GERALD BLAIN

Imagine having all the most important data about your entire boiler room on a single 12.5-inch screen.

The more data you have, the more effectively you can make decisions about how to run your boiler as efficiently as possible.

And that's what's special about the Autoflame Mk8.

It's a single controller designed to do everything for your boiler. It shows crucial data points about your burner, water level, draft control, and more. It lets you use up to four fuels, four servos, and two variable speed drives.

And it's designed to be easy-to-use, simple, and accurate.

One of our favorite things about the Mk8 is the fact that it stores detailed history for 24 hours. This includes things like air pressure, firing rate, gas pressure, and a lot more.

Even more impressive is the fact that the Mk8 logs the last 1,000 things that have happened in the boiler room, creating a digital boiler log book.

And, in its system configuration, it allows over 160 different option settings.

You can customize this controller to include the exact information you want to use to help operate your boiler.

It also shows information about faults (including lockouts), errors, alarms, warnings, and even up to 15 first-outs (which can be totally customizable to your operation).

It even has an IBS (Intelligent Boiler Sequencing) screen that lets you see all of your boilers and sequence up to 10 systems.

Beyond that, everything on the Mk8 is password-protected for security, which is a theme you'll see throughout its design.

You might be thinking that the Mk8 sounds like a PLC (programmable logic controller)...

But it's not.
The Mk8 is advanced combustion management beyond the capabilities of a PLC. And it's more secure too.

Here's why:
Since the Mk8 is not a PLC, it cannot be influenced by outside sources. It cannot be accessed remotely. It operates off of hard-written code within the controller itself, making it more secure than a PLC.

If you're interested in learning more about how the Autoflame Mk8 might be able to improve your boiler room operations, just give us a call at 1-800-228-8861.

AUTOFLAME TRAINING AVAILABLE

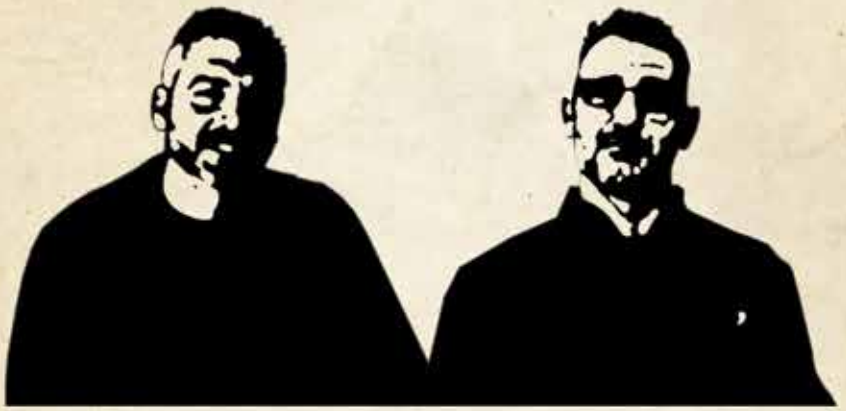
September 19 - 20, 2019 - Chattanooga, TN
September 23 - 24, 2019 - Louisville, KY
CALL 800-228-8861 FOR DETAILS

YouTube

WAREBOILERS

#1 ONLINE RESOURCE FOR BOILER EDUCATION

NEW VIDEOS UPLOADED ALL THE TIME



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

Weekly on Wednesdays get the latest Boiler Tips.

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

WE EAT AND BREATHE STEAM

FUN

VIDEOS ARE INFORMATIONAL AND FUN INVOLVING BOILERS, BURNERS AND MORE FROM AN INDUSTRY LEADING BOILER COMPANY.

52

- BOILING POINT
- STEAM CULTURE
- CASE STUDIES
- WARE CAPABILITIES
- FUN WARE VIDEOS
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Subscribe WAREBOILERS for future episodes

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
SSB44	800XID	2018	Victory Energy	(Low NOx) G#2	Steam	250	UL/CSD-1
620	800	1975	York-Shipley	G/#2	Steam	250	IRI
SSB42	600XID	2018	Victory Energy	(Low NOx) G/#2	Steam	250	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
SSB43	250	2018	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
415	250	1980	Eclipse	#2 Oil	HT/HW	954	IRI
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

WARE new and used List

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.
SB-213	175XID	2014	York-Shipley	G/#2	Steam	150	UL/CSD-1
SB-220	175XID	2015	York-Shipley	G/#2	Steam	150	UL/CSD-1
SB-240	175XID	2017	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB-20	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
SB-216	250	2015	York-Shipley	G/#2	Steam	150	UL/CSD-1
SS-B38	150	2017	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SB-245	150	2018	Victory Energy	G/#2	Steam	150	UL/CSD1
SB-242	150	2017	Victory Energy	G/#2	Steam	150	UL/CSD1
769	150	1998	Precision	Electric	Steam	150	UL
SB-246	100	2019	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-239	100	2017	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB-41	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
SSB-35	70	2016	Victory Energy	(Low NOx) G/#2	Steam	150	UL/CSD-1
SB-216	50	2019	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-234	50	2016	Victory Energy	G/#2	Steam	150	UL/CSD-1
SB-244	100	2018	Victory Energy	G/#2	Steam	150	UL/CSD-1
SSB-45	50	2019	Victory Energy	G/#2	Steam	150	UL/CSD-1

EVENTS
EVENTS
EVENTS

WARE will be exhibiting at:

Processing Expo - Oct. 8 - 11, 2019 - Chicago, IL
Power-Gen Int. 2019 - Nov. 19 -21, 2019 - New Orleans, LA
IPPE EXPO 2020 - Jan. 28 - 30, 2020 - Atlanta, GA
AHR EXPO 2020 - Feb. 3 -5, 2020 - Orlando, FL
Campus - Feb. 10 - 14, 2020 - Denver, CO
NFMT - Mar. 17 - 19, 2020 - Baltimore, MD
AAE - Apr. 21 - 22, 2020 - Cincinnatti, OH
IDEA - Jun. 22 - 25, 2020 - Washington, D.C.

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WARE new and used List

BOILER TRAINING

CATASTROPHES CAUSED BY HUMAN ERROR

Boiler and Pressure Vessel incidents, which can have devastating consequences, are usually the result of human error (improper installation, improper repair, low-water condition, operator error or poor maintenance).

101 CLASS - $1,200.00

Is a two-day introduction to the boiler room, covering all of the important aspects from water treatment and boiler operations, to condensate systems. This seminar style, media-rich class offers a great first look at boilers for beginners, and a great review for experienced operators.

101 CLASS 2019 - 2020

October 8-9, 2019 - Louisville, KY
October 15-16, 2019 - Savannah, GA
February 11-12, 2020 - Knoxville, TN
March 17-18, 2020 - Bowling Green, KY
April 7-8, 2020 - Chattanooga, TN
May 12-13, 2020 - Louisville, KY
July 28-29, 2020 - Ashland, KY

201 CLASS 2019 - 2020

September 17-19, 2019 - Louisville, KY
November 12-14, 2019 - Louisville, KY
January 28-30, 2020 - Louisville, KY
March 10-12, 2020 - Louisville, KY
April 21-23, 2020 - Louisville, KY

201 CLASS - $1,800.00

Is a three-day program building on the 101 foundation, but adding the full experience of our Louisville Boiler Lab, providing hands-on opportunities on many subjects with our four fully operational lab boilers. Beginners will get the full perspective of an operating system, and even seasoned operators and contractors will gain valuable insight from displays, such as our fully glass piped steam and condensate system demonstrator.

For Other Classes Offered
Visit www.wareboileruniversity.com for details

Classes are four hours long
BOILER 202 - Daily Boiler Operations
BOILER 203 - 4 Hour Steam System Basics
BOILER 204 - Safety and Limit Checks
BOILER 205 - Energy Efficiency Options

Classes are three days long
BOILER 301 - Boiler Open/Close
BOILER 302 - Principles of Combustion
BOILER 303 - Hands on Flame Safeguard and Boiler Control Wiring
BOILER 304 - Feedwater and Level Control

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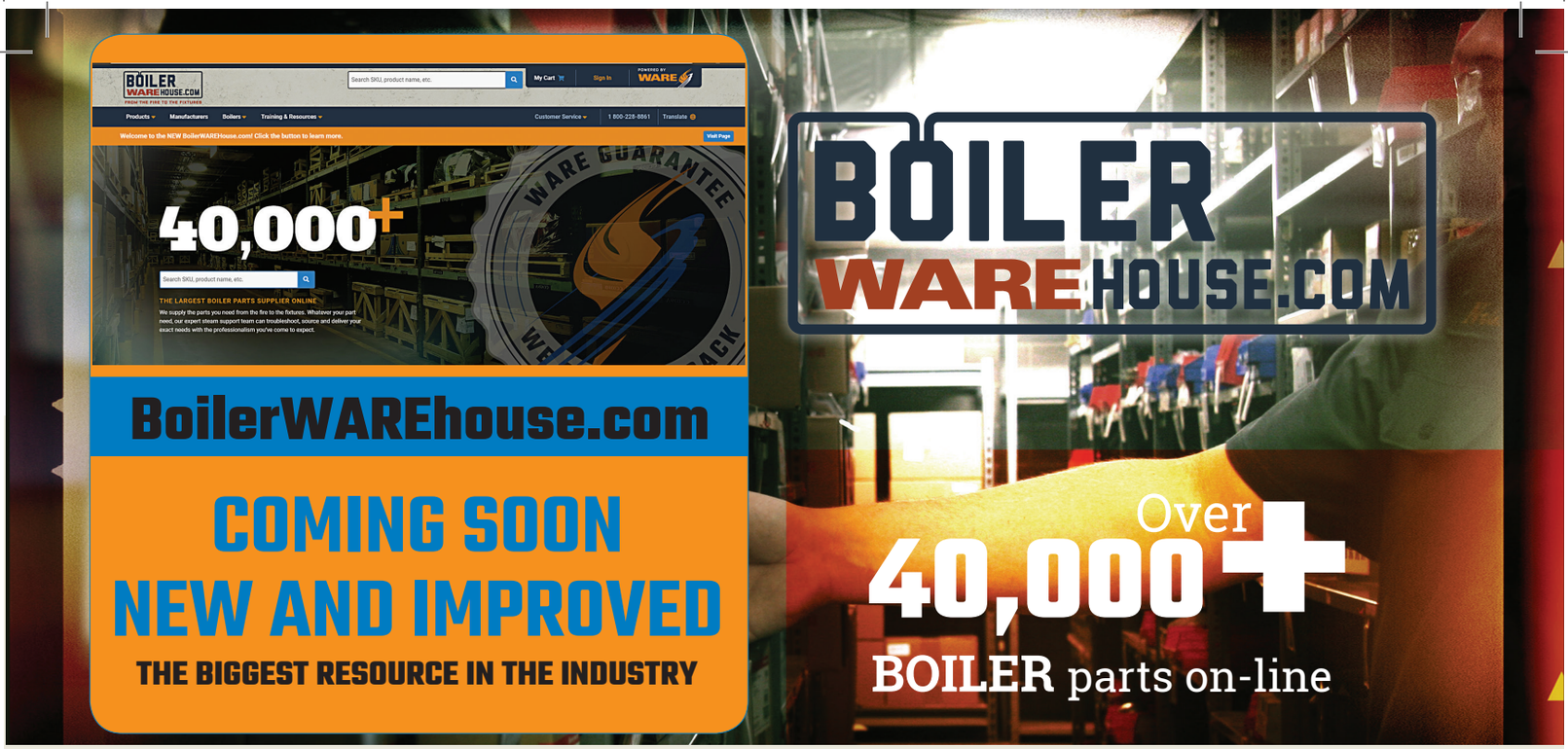

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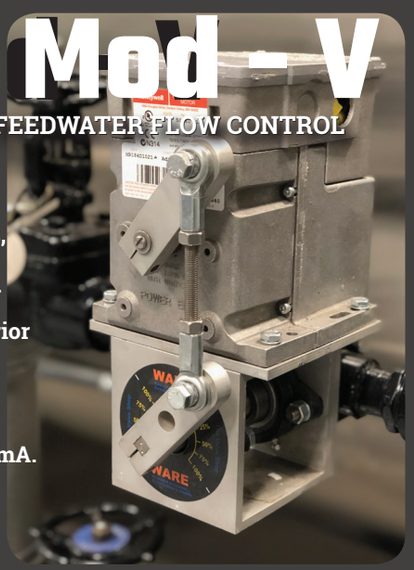

YouTube Watch WAREboilers channel

WATCH - Common Problem fixed for boiler feedwater valves **On the Boiling Point**

and a **WHOLE LOT MORE**

New website coming soon!

Like anything else, constant use will cause wear and tear on refractory, so it should be periodically inspected to ensure that it is in good condition. Small cracks in limited areas may be of little concern, as the refractory will typically expand when heated, thus sealing those cracks. If, however, there are long or very wide splits, sizeable chunks missing, or areas where it is flaking off layers at a time, then maintenance is needed. For minor or temporary repairs, small amounts of refractory repair can be mixed up and applied to patch the affected areas—the material appears similar to grout or mortar. More extensive damage is usually found when there are leaks in the boiler and water is allowed to come into contact with the refractory, which softens the material and allows it to come apart rapidly; so if maintenance is being performed for a tube leak, be sure to check the refractory in the vicinity of the leak or where water was running out of the boiler. If there is a pile of the material in the bottom of the furnace when it is opened up, that is a clear sign that repair is needed.

When refractory is sufficiently damaged, it may not be patched, but will have to be completely wrecked out and re-poured. There are dedicated refractory companies who can perform this service to the boiler manufacturer's recommendations. Once the refractory has been repaired, it must be "cured" to solidify and develop its full strength. Some of this process is done at ambient temperature, but it is most often finished by bringing the boiler online and allowing the heat to finish the "curing" process. This procedure is generally outlined by the refractory professional, and it may require slowly building or maintaining temperature for various amounts of time. Always follow the instructions to ensure that the refractory is allowed to cure properly, or else the whole process may have to be done all over again.

When the boiler is taken offline for the annual inspection, be sure to thoroughly check for any cracks, flaking, chunks missing, or punctures/abrasions from tools that may have accidentally come into contact with the refractory during maintenance. While the boiler is running, a key indicator that there may be a refractory issue is "hot spots" that develop on the boiler. This is often indicated by a discoloration in the paint, but it can be routinely checked by shooting the exterior of the boiler with an infrared sensing gun or a thermal camera. If there is an area that has a much higher temperature than its surroundings, it is worth investigating. It may even present a noticeable difference in ambient temperature around the affected area. Preserving the integrity of the boiler's refractory will help to keep the boiler from experiencing a failure due to overheating, and it will keep the system more efficient by not allowing excess heat to escape. Be sure to add a refractory inspection to regular maintenance procedures, and when in doubt, call a boiler or refractory professional to ensure that the equipment is in proper shape to continue providing safe, reliable service.

Shocking Steam Boiler Refractory

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