WARE
Powerful solutions... Extraordinary results.
The GRIME
February and March 2013 Newsletter

Knowing water treatment requirements helps treat potential problems

The main role of a boiler is to deliver hot water and/or steam to provide heat for buildings or power industrial processes. When steam is involved, every boiler faces the same potential complications: scale, corrosion and carryover. Knowing the type of boiler and the water treatment requirements, will enable the operator to know how to prevent these problems.

There are three main types of boilers: fire tube/Scotch Marine boilers, water tube boilers and cast iron sectional boilers.

Fire Tube/Scotch Marine Boiler

This large boiler contains a series of tubes and a fire box on one end that shoots fire through the insides of the tubes. The heat can be provided by coal, natural gas or fuel oil, which is how it got the name fire tube. Water flows within the outer shell of the boiler and is heated to provide hot water or steam.

Water Tube Boiler

This boiler contains a system of tubes filled with flowing water. The fire box is designed to produce hot water and steam by shooting fire around the water tube.

Cast Iron Sectional Boiler

This boiler is similar to the water tube boiler, but instead of tubes filled with flowing water, there are sections similar to a radiator through which the water flows. The water flows through the sections as it is heated by fire radiating through the sections.

Other boilers, like the steam generator, are simply variations on these three boilers. Steam generators, which are a type of water tube boiler, can be described as an instant hot water heater. Inside the flame chamber is a number of small-diameter tubes filled with water.

Fire Tube Boiler

Water Tube Boiler

Determining proper water treatment

The amount of water in the boiler per horsepower is essential in determining proper water treatment. Fire tube boilers hold large amounts of water per horsepower and can better handle differences in water quality or demand.

On the other hand, water tube and cast iron boilers have less water per horsepower and they are more vulnerable to scale and corrosion problems through changes in water quality and demand. Steam generators, with the least amount of water per horsepower, can be negatively affected by the water quality.

In summary, all boilers do the same jobs but in different ways. But it is always important to remember that the water treatment programs for water tube, cast iron boilers and steam generators should be closely monitored.

Information for this tip was taken from The National Board of Boiler and Pressure Vessel Inspectors. More information can be found at www.nationalboard.org.

Congratulations to Ray Grote from CSI Services for winning the iPAD giveaway in January.

If you haven't registered yet you still have time.

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THE VALVE SHOP℠

Check The Valve Shop out. They offer testing, diagnosis, steam studies, maintenance and repair services for all makes and models of valves. All Valve Shop repair procedures strictly adhere to the industry standards and codes.

Minimizing blowdown rate can substantially reduce energy losses

The importance of boiler blowdown is often overlooked. Despite the best efforts to pretreat boiler feedwater, it can still contain impurities including suspended and dissolved liquids. These impurities can accumulate inside the boiler and cause problems with piping, steam traps and other process equipment. To avoid problems, the water must occasionally be discharged or "blown down" from the boiler.

Minimizing the blowdown rate can substantially reduce energy losses and improper blowdown can cause increased fuel consumption, require additional chemical treatments and heat loss. In addition, since the blowdown water is the same temperature and pressure as the boiler water, it can be recovered and reused in the boiler operations.

Suggestions:

1. Review blowdown practices to identify energy saving opportunities.

2. Examine operating practices for boiler feedwater and blowdown rates developed by the American Society of Mechanical Engineers (ASME), include operating pressure, steam purity, and deposition control.

3. Consider an automatic blowdown control system.

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Equipment List

All equipment listed is for sale or lease and is subject to availability

Unit	HP/PPH	Year	Manufacturer	Fuel	Type	Pressure	Controls
767	75,000	2011	Victory Energy	G/#2	Steam/SH	750/750	IRI
747	75,000	2000	B&W (Low NOx)	G/#2	Steam/SH	750/750	IRI
750	70,000	1996	Nebraska (Low NOx)	G/#2	Steam/SH	750/750	IRI
752	60,000	1980	B&W	G/#2	Steam	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
SB79	40,000	1986	Cleaver Brooks	Gas	Steam	260	IRI
SB80	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
SB150	800	2011	Victory Energy (Low NOx)	G/#2	Steam	300	IRI
SB123	600	2008	York-Shipley	G/#2	Steam	150	UL/CSD1
SB149	500	2011	Victory Energy (Low NOx)	G/#2	Steam	250	IRI
SB139	500	2001	Cleaver Brooks		Steam	150	
SB63	500	1985	Superior	G/#2	Steam	150	IRI
SB152	400	2011	York-Shipley (Low NOx)	G/#2	Steam	150	UL/CSD1
SB138	350	1994	Cleaver Brooks		Steam	150	
SB137	250	1994	Cleaver Brooks		Steam	150	
415	250	1980	Eclipse	#2 Oil	HT/HW	954	IRI
719	250	1987	Superior	G/#2	Steam	150	IRI
SB148	200	1995	Kewanee	Gas	Steam	325	IRI
SB146	200	1995	Kewanee	Gas	Steam	325	IRI
SB170	250XID	2012	York-Shipley	G/#2	Steam	150	UL/CSD1
SB172	175XID	2012	York-Shipley	G/#2	Steam	150	UL/CSD1
SB183	175XID	2012	York-Shipley	G/#2	Steam	150	UL/CSD1
SB175	150	2012	York-Shipley	G/#2	Steam	150	UL/CSD1
SB181	150	2012	York-Shipley	G/#2	Steam	150	UL/CSD1
SB182	150	2012	York-Shipley	G/#2	Steam	150	UL/CSD1
RB769	150	1998	Precision	Electric	Steam	150	UL
SB131	100	2003	Johnston	G/#2	Steam/HW	15/30	IRI
SB178	100XID	2011	York Shipley	G/#2	Steam	150	UL/CSD1
SB177	100XID	2011	York Shipley	G/#2	Steam	150	UL/CSD1
SB184	70	2012	York Shipley	G/#2	Steam	150	UL/CSD1
SB180	50	2011	York Shipley	G/#2	Steam	150	UL/CSD1

Request a quote on-line at www.wareinc.com or call 800-228-8861

WARE buys used boilers

All equipment listed is for sale or lease and is subject to availability

Unit	Size	Manufacturer	Voltage	Type	Year
RC-24	30 Ton	Mc Quay	480 v	3 ph	2000
RC-21	40 Ton	Mc Quay	480 v	3 ph	1999
RC-1	60 Ton	Mc Quay	480 v	3 ph	1995
RC-2	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-8	155 Ton	Mc Quay	480 v	3 ph	1995
RC-10	195 Ton	Mc Quay	480 v	3 ph	1995
RC-11	195 Ton	Mc Quay	480 v	3 ph	1995
RC-25	300 Ton	Mc Quay	480 v	3 ph	2003

New YORK SHIPLEYS AVAILABLE

Unit	HP/PPH	Year	Manufacturer	Fuel	Type	Pressure	Controls
SSB23	50 hp	2012	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB21	70 hp	2012	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB22	100XID	2012	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB18	150	2011	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB20	175XID	2012	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB25	250XID	2012	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB14	300XID	2011	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB8	400XID	2011	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB15	500XID	2011	York Shipley	(Low NOx) G/#2	Steam	150	UL/CSD-1
SSB24	600XID	2012	York Shipley	(Low NOx) G/#2	Steam	250	UL/CSD-1
SSB11	800XID	2011	York Shipley	(Low NOx) G/#2	Steam	250	UL/CSD-1

New T- Shirt Designs at 4steamware.com

Boiler Makes Steam - Steam Makes Whiskey - Whiskey Makes My Baby a Little Bit Frisky

All net proceeds from the sale of Steam Ware T-shirts go to Kosair Charities. Where health care is provided to Children when there is no one else to turn to. Check it out on www.4steamware.com

What we loved

This past January Ware attended the AHR Expo in Dallas. During this show we loved getting to meet the most interesting people in our industry. We loved seeing past customers and reminiscing about the jobs or projects that we helped them with. We loved seeing the light bulb go off in some-one's head, when they discovered there was a company that would actually rent a complete boiler room inside a container and that it could be delivered and piped up to their facility to solve a problem they were having or potentially could have.

And what's not to love when people told us they had been looking for our booth because they love and collect the boiler industry t-shirt we give away each year.

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Minimizing blowdown rate continued from pg2

Types of blowdowns

Surface blowdowns are used to remove particulates, dissolve materials in the boiler water and to control boiler water chemistry. Surface blowdown can reduce contamination or boiler water that has been overtreated with chemicals.

Mud or bottom blowdowns are used to control the amount of sludge in the boiler water and remove suspended solids that settle out of the boiler water and form a heavy sludge. These blowdowns are usually a manual process that last a few seconds done in intervals of several hours.

Usually, blowdown rates range from 4% to 8% of the boiler feedwater flow rate, but can be as high as 10% when makeup water has a high solids content. The optimum blowdown rate is determined by several factors including the boiler type, operating pressure, water treatment, and quality of makeup water.

Automatic Blowdown Control Systems

Conductivity, total dissolved solids (TDS), silica or chlorides concentrations, and/or alkalinity are reliable indicators of salts and other contaminants dissolved in boiler water. An automatic blowdown control system can monitor the pH and conductivity of the boiler water and allow blowdown only when necessary. Automatic blowdown control systems with continuous blowdown TDS measurements are available on the market with a probe that provides feedback to a controller driving a modulating blowdown valve.

EXAMPLE
Assumptions:
- Installation of an automatic blowdown control system reduces blowdown rate from 8% to 6%
- Makeup water temperature of 60°F
- Boiler efficiency of 80%
- Fuel valued at $8.00 per million Btu ($8.00/MMBtu)
- Total water, sewage, and treatment costs at $0.004 per gallon

Boiler Feedwater Initial: 100,000/(1 - 0.08) = 108,696 lb/hr
Final: 100,000/(1 - 0.06) = 106,383 lb/hr
Makeup Water Savings = 108,695 - 106,383 = 2,312 lb/hr
Enthalpy of Boiler Water = 338.5 Btu/lb; for makeup water at 60°F = 28 Btu/lb
Thermal Energy Savings = 338.5 - 28 = 310.5 Btu/lb

Annual Fuel Savings
2,312 lb/hr x 8,760 hr/year x 310.5 Btu/lb x $8.00/MMBtu/(0.80 x 106 Btu/MMBtu) = $62,886

Annual Water and Chemical Savings
2,312 lb/hr x 8,760 hrs/yr x $0.004/gal/8.34 lb/gal = $9,714

Annual Cost Savings = $62,886 + $9,714 = $72,600

Adapted from an Energy TIPS fact sheet that was originally published by the Industrial Energy Extension Service of Georgia Tech.

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