The Benchmark

B&D BOILERS

Spring 2010

Plugging a Tube: Repair or Temporary Fix?

It is common practice to plug leaking tubes in boilers, economizers, heaters, heat exchangers, chillers or any other tubular equipment in order to stop a leaking tube. Unfortunately, many consider this an acceptable repair. This work is not recognized by the NBIC (National Board Inspection Code) as a repair method. The Code does not recognize "temporary repairs".

Plugging removes the tube from service. In doing so you have:

- Decreased the heating surface
- Reduced the heat transfer
- Reduced the efficiency of the equipment

This can be very critical. Take a water tube boiler for example. Plugging of tube(s) forming furnace walls, enclosures or gas passages can promote damage to the equipment; whereas a limited number of boiler bank or generating tubes can be plugged without jeopardizing the equipment's operation or integrity.

The following should be considered before plugging a tube:

1. Location of the tube – as referenced above.
2. Number of plugged tubes – certain regulations will only allow a certain percentage of plugged tubes.
3. Concentration of multiple plugged tubes - lack of proper heat transfer can cause temperature to surpass the limit of the metal resulting in failure of major equipment components.
4. Efficiency – there is a financial trade-off with a reduction in output from the equipment.

Tube plugging certainly provides the owner with the opportunity to operate equipment until a convenient time for Code repairs to be made. The decision to plug should always consider the impact on the equipment. Owners should always seek consultation from a reputable Code repair contractor, engineering firm (with boiler knowledge) and/or OEM.

Running With A Cause

Last year B&D CEO, Toby Kearney, and his wife, Melissa, ran a half marathon to raise money for Camp Happy Days, an organization that provides programs for children with pediatric cancer. This past December, they embarked on doubling last year both in mileage and fundraising by running the Kiawah Full Marathon.

In total, $2,800 was raised and donated to the American Cancer Society. We graciously thank all of the B&D affiliates who donated time and funds to this cause.

WBENC Women's Business Enterprise National Council

CREATING OPPORTUNITIES
RECOGNIZING EXCELLENCE

Woman Owned Reinstatement

This past fall, the Women's Business Enterprise National Council (WBENC) in partnership with the Greater Women's Business Council certified that B&D Boilers meets the criteria as a Women's Business Enterprise.

CB Rear Doors

To purchase a new Cleaver Brooks rear door typically costs 50% more than refurbishing or replacing with a remanufactured or used door. B&D can completely refurbish a rear door with high temperature refractory or cerwool blanket to like new condition. More often, we may have a remanufactured door in stock. Size range includes 48", 60", 78" and 96" diameter. Currently we are listing the following for immediate purchase:

Size	Market Price	Sale Price
96" Monolithic	$13,500	$11,000
96" Qty (2) Refurbished	$11,000	$9,500
96" Used/Good Condition	$9,500	$7,500
78" Used/Good Condition	$7,500	$6,000

"New Reality"

With the unprecedented volatility that we have experienced in the industrial and energy construction markets in 2009, B&D knew we were all headed for a new reality. Industrial and utility customers significantly reduced their planned capital expenditures. This was painfully obvious when we were awarded millions of dollars in contracts only to have a corporate wide CapEx freeze by the awarding client.

Many competitors have become desperate. In this newly competitive market, the temptation is to assume unwarranted risk by low-balling a bid and try to make it back into the black once you have crews in a plant. It seems that today we have more vendors that are willing to sign anything [at any price] just to stay in business. Compounding this paradigm are the lending institutions. Traditional banking relationships have been replaced with complicated derivative means of short-term lending and credit. Formerly strong contractors are faced with a new world. It is no longer as simple as having good people, good equipment and good relationships. But, there is a silver lining.

There are ways to turn downsizing and budget cuts into improvement opportunities. If a firm is able to stay on or ahead of the curve with eliminating inefficiencies and increasing productivity with less means, margins will increase.

In early 2009, B&D implemented a plan to streamline its core domestic business. We have reduced overhead by 40% since January 2009. We still retain employees in North and South Carolina; however, we have reduced our full-service fabrication facilities to Greenville and North Charleston. With this and other positive cuts, we have decreased our cost of doing business, lowered prices to the customer and gained more control over operations.

Biomass

We are all aware of the Green Revolution. With its momentum, plant owners are now considering biomass energy as a source for their boilers. Biomass is regenerative organic material used for energy production. Sources for biomass fuel include terrestrial and aquatic vegetation, agricultural and forestry residues, and municipal and animal wastes.

It quickly begs the question: Why is burning anything considered "Green"?

Both fossil and biomass fuels return carbon to the atmosphere: however, fossil fuel more rapidly increases carbon dioxide (CO_2) concentration during combustion. Biomass is considered carbon neutral because the CO_2 released can be managed sustainably by planting new growth that will absorb the future emissions.

There is a wide variety of biomass boiler types ranging from output capacities as low as 100 MBtuh to full size power plants.

Industrial – hybrids allow use of solid biomass fuels as well as fossil fuels. In the event that the biomass source of fuel is not available, the plant avoids a forced outage.
PowerGen - electric power production uses direct combustion. The thermal energy released is used to produce steam and ultimately electricity.

B&D has had the privilege of working with customers utilizing biomass boilers in the following industries:

- Waste Disposal
- Power generation
- Recycling
- Manufacturing

CO2 Reduction Demands New Material Development

The demand to decrease carbon footprints has been a force behind innovation. In order to reduce emissions and increase efficiencies in power plants, levels of efficiency greater than 50% have to be achieved. This is only achievable with new materials that could withstand higher temperatures and pressures. In 2005, COORETEC (CO_2 Reduction Technologies) in cooperation with ThyssenKrupp VDM developed a new higher strength material known as Nicrofer 5520CoB (Alloy 617B). By controlling the strength enhancing elements aluminum, titanium, cobalt and carbon this material can achieve 20% greater allowable stresses than traditional Alloy 617.

Today, supercritical steam generators are commonly used to produce electricity. Hence their name, these units operate at supercritical pressure (over 220.6 bar or 3,200psi). Actual boiling ceases and the unit has no water/steam separation. Above the critical temperature a liquid cannot be formed by an increase in pressure. But with enough pressure a solid may be formed.

With the introduction of such new materials, such as Alloy 617B, engineers are designing a new breed of power plants. New designs for ultra-Supercritical power plants are in the works. Whereas today's supercritical boilers (600°C and 25Mpa) operate in the 40 – 45% range, USC's have been targeted to produce efficiencies of 50% with operating conditions of 700°C and 30Mpa.

Hurst Hybrid HD Series - Available for any liquid or gaseous fuel. Sizes from 100 to 2,500 horsepower with pressures to 450 PSI.

bar is a unit of pressure roughly equal to the atmospheric pressure on Earth at sea level.

B&D Boilers
Corporate Headquarters
P.O. Box 71687
Charleston, SC 29415
www.bdboilers.com
800-845-5877

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