

Are You Using Protection?

No, not that kind of protection! I'm talking about job site safety. The three basics: hard hat, ear protection and safety glasses, must be part of every construction site safety regiment. And, where appropriate, dust masks, respirators and fall protection.

According to OSHA, in the more than 1,000 eye injuries that occur DAILY on the job, 90% of these injuries could have been prevented with the use of protective eyewear. The most common excuse for not using protective devices is that they are inconvenient. Well, nothing is more inconvenient than blindness or deafness. Do we need to mention closed head injuries? Safety is everyone's responsibility, both to make sure proper equipment is issued and that everyone is using it.

Safety goes beyond just equipment. It also means that construction areas are roped off and warning signage is in place. It means non-construction personnel are not permitted passage through construction areas. It means barricades are erected around open pits and drop-offs. It means work areas are kept free of debris.

Safety cannot be stressed too often or too strongly. Carelessness is always waiting in the shadows. Don't be a statistic. Think job safety, live job safety, and go to work another day.

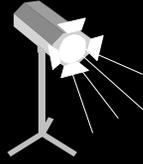


"Lipten administers a complete safety program at every jobsite to ensure the safety of our employees, our contractors and our customers."



Did you know ...?

The biggest enemy of your boiler is poor water quality. Minerals, dissolved oxygen and extreme PH levels all work to reduce the life of your boiler tubes. A regular practice of softening, deaerating and PH balancing can add tens of years to the life of your boiler. Call Lipten today to learn more on what water treatment program is right for you.



Spotlight On ...

Glen Altpfart



Among other qualifications, Glen is Lipten's combustion expert, with over twenty years of experience in the design and application of both gas and oil burners. Glen's contributions have been invaluable in solving many of our customer's difficult coal-to-gas

boiler conversion problems.

Glen has highlighted his career with numerous accomplishments:

- Introduced Pillard Combustion's previously unknown Low NOx Burner technology to the United States' and Mexico's Industrial and Utility Boiler markets.
- Joint inventor of the Todd Variflame II™ Industrial Low NOx Burner.
- Designed and introduced a new Low NOx Industrial Burner for Peabody Engineering.
- Successfully brought a new **Ultra-Low NOx** (<10ppm) burner technology to full commercialization.

Education

Bachelor of Science-Mechanical Engineering

University of Connecticut

Career History

Todd Combustion, Inc.

- Director of Industrial & Utility Burner Sales
- Product Manager – RMB Ultra-Low NOx Burner
- Manager, Project Management Department
- Chief Engineer

Pillard Combustion, Inc.

- US National Sales Manager

Peabody Engineering, Inc.

- Mechanical Engineering Manager
- Sales/Application Engineer
- Project Manager
- Project Engineer

Associate Member-ASME

Glen resides with his wife and children in Monroe, Connecticut where he operates one of Lipten's regional offices.

Lipten Company – Pioneers in Vertical Fired Burner Conversions of Stoker Coal Fired Boilers to Natural Gas

by Glen Altpfart, *Region Operations Manager*

Many industrial clients are upgrading their power plants by converting existing coal fired boilers to natural gas firing to:

- Eliminate coal storage problems
- Eliminate operations and maintenance problems associated with coal handling
- Eliminate operations, maintenance and environmental problems associated with ash handling
- Improved operational flexibility
- Improved boiler operating efficiency
- Reduced NO_x, SO₂, CO and particulate emissions regulations

Wall Fired or Vertically Up-fired Gas Burners?

As with all boiler retrofits, there are concerns that must be addressed to ensure the retrofit produces the desired results, as outlined above. When considering the wall fired burner option, these include:

- Determining the number of burners required
- Selecting the proper burner type
- Limited improvement in boiler operating efficiency as a result of having to operate the burner(s) at higher than expected excess air levels to avoid the problems associated with flame impingement
- Potentially high cost resulting from the need to modify boiler pressure parts, possibly relocate lower boiler steam headers, installing multiple burners and fuel trains
- More complex Burner Management and Combustion Control Systems associated with multiple burner in-

stallations.

- Limited floor space creating problems with locating fuel trains and combustion air fans.

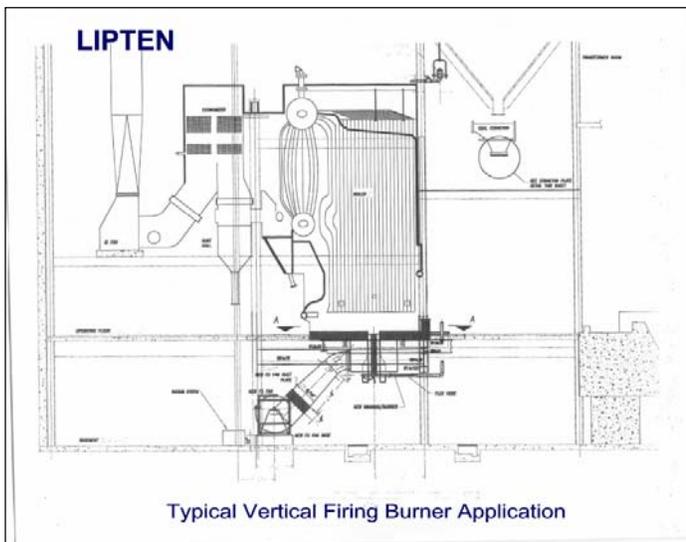
The concerns outlined above, prompted a need for an innovative alternative approach to the conventional wall fired burner approach. Since the stoker grate and ash hoppers typically have to be removed and replaced with a new furnace floor regardless of where the new burner(s) would be located, locating a single burner and combustion air fan in the space now made available below the boiler would simplify the retrofit and shorten the installation schedule. Additionally, producing a single flame, with the proper geometry, positioned symmetrically within the furnace meets the following objectives:

- Eliminate costly pressure part modifications
- Create more uniform heat flux within the furnace
- Improve boiler circulation patterns
- Improve operational flexibility through increased burner turndown
- Lower operating excess air levels and improve thermal efficiency
- Lower stack emissions levels (as low as 9 ppm NO_x)
- Simplify operation and reduce maintenance costs
- Lower installation and operating costs

“Lipten’s development of a successful approach to vertically up-fired retrofits began over ten (10) years ago ...”

Lipten’s development of a successful approach to vertically up-fired retrofits began over ten (10) years ago with a detailed evaluation of all the currently available commercial burner technologies. Conventional low excess air burners and low NO_x burner designs employing staged air combustion techniques did not produce the flame pattern that was needed to achieve the desired results. Continued research and burner technology assessment resulted in the selection of a low NO_x burner design employing a staged fuel-firing technique. This axial flow burner design utilized the burner’s aerodynamics to produce a combination of swirl and bluff-body effect to stabilize the flame. A preset ratio of tangential to axial momentum could be adapted to effectively produce a short, wide flame closely approaching that of stoker fired coal. The axial, radial and tangential turbulent air-flow field generated at the burner outlet was com-

(Continued on page 4)



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(Continued from page 3)

bined with high velocity fuel jets, resulting in an optimized and well defined mixing pattern for maximum local mixture homogeneity and uniform heat flux along the length of the flame.

The next step was to evaluate the currently available electronic and controls technologies to determine which would be best suited in the design of a fully integrated, easily operated, user friendly Burner Management System and Combustion Control System and ensure safe, reliable, automatic operation of the boiler, burner, combustion air fan and control devices.

Over the years since it's inception, further enhancements to Lipten's system design include the use of new "state of the art" low and ultra low NOx (<10 ppm) burners, variable frequency drives for the combustion air fan motor, fully integrated oxygen trim systems and the development of improved combustion control algorithms to maintain tighter control of fuel-air ratios on both increasing and decreasing boiler steam demands.

Lipten Company has successfully completed many vertical up-fired boiler conversions with improved boiler efficiency and significant reductions in NOx and carbon monoxide emissions.



LIPTEN

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