LIPTEN™
A Quarterly report from the "Hands On" EPC Energy Solutions Company
e advantage
3rd Quarter, 2011

Steamin' Hot NEWS

Lipten's extensive search for the best and brightest engineers in power generation has led to the hiring of additional staff to support the growing demand for Lipten's energy engineering, procurement and construction services. The latest members of the Lipten family include three certified Professional Engineers (PE) as well as engineers, project managers and Computer Aided Design (CAD) operators with experience and advanced degrees in thermal, mechanical, electrical and controls engineering.

The new engineers bring experience in power plant design including work at several 100+ MW electrical utility plants, a 1.05 million lbs/hr steam thermal and chiller central energy plant, and dozens of industrial central utility facilities. The engineers' education and professional experience aligns with Lipten's energy design and construction expertise.

"We are very thankful to have projects that allow us to add top notch people to our team," said Jim Marshall, Vice-President of Operations, "the new personnel coupled with our valued in-place team insures our capability to better serve our clients."

Efficiency Gains Using a Condensing Heat Exchanger

Lipten recently completed a project involving the engineering and installation of a 70,000 lb/hr steam boiler and condensing heat exchanger. Lipten designed the custom controls associated with the boiler and heat recovery system.

The condensing heat exchanger utilizes the exhaust gas from the boiler to heat makeup water for delivery to the Deaerator, thus reducing the fuel (steam) requirements of the Deaerator (boiler) to bring the water up to saturation temperature.

A typical boiler flue gas heat exchanger (known as an economizer) would be designed such that heat transfer would maintain the flue gas temperature above ~300°F so that the water vapor in the flue gas does not condense and ruin the stack, heat exchanger and boiler. Since this system is specially designed with stainless steel components it can transfer more heat to the make up water from the flue gas, thus increasing overall central utility plant efficiency.

Spotlight On . . .
James Ulrey P.E., Project Manager

James Ulrey P.E., *Project Manager*

Jim is a project manager that specializes in power plant projects and has experience ranging from 50,000 lbs per hr boiler installations to new 500 MW power plant construction. Jim has a B.S. degree in electronic engineering technology and is a certified Professional Engineer (PE). Jim's major project accomplishments include:

- Led main engineering effort in "Matching Conferences" coordinating the interface between the major equipment suppliers including Furnace/Boiler, Turbine, and Plant Control System for a 500 MW power plant.
- Researched the once-through, supercritical design of the standard Korean power plant and prepared technical paper on the unique turbine bypass control features enabling daily startup and shutdown of 1000 MW facilities. The article won the 2nd place award for all technical papers written in Korea that year.
- Created presentations for Power-Gen and ISA Conferences.
- Organized entire 600 MW power plant in terms of process control and the I/O to a DCS. Led the design in the preparation of a complete set of DCS P&ID's.

LIPTEN CONTROLS CORNER

Dan Tavernit,
Controls Manager

In a boiler, burners require both fuel and oxygen to produce a flame. Automatic controls monitor and adjust oxygen levels to provide the proper balance between fuel and oxygen. This balance is key to maintaining a safe, efficient combustion process. Incorrect oxygen levels can allow non-combusted fuel to escape, require more fuel to meet load demands, and increase production of harmful pollutants.

Tramp Air refers to oxygen that enters (infiltrates) the boiler system through cracks, holes, leaks, etc. This oxygen is not intended for use during combustion, is not a controllable process condition, and has no direct effect on flame quality.

Case Study: Recent service work for a valued Lipten client, uncovered issues within the combustion process of a 150,000 lb/hr Watertube Boiler. The burner's flame was unstable, and very weak. Controls for monitoring and adjusting the amount of oxygen supplied to the burner appeared to be functioning properly.

Using a portable oxygen analyzer, the Lipten Technician was able to confirm instruments measuring oxygen levels present within the Flue Gasses were providing accurate results. He was also able to confirm the control system was reacting to the results, and functioning properly. Further investigation, noted poorly maintained boiler ductwork, with numerous cracks, spaces and holes.

It was determined that the ductwork was allowing Tramp Air to adversely affect the amount of Excess Air being provided to the burner. Oxygen being introduced to the Flue Stack was providing a higher concentration of oxygen in the Flue Gas. The artificially high oxygen content was not an accurate representation of actual combustion, and was causing the control system to lower the amount of Excess Air. The end result was a weak flame, and an unsafe, inefficient combustion process.

Based upon the findings of the Lipten Field Technician, the client is in the process of making the repairs necessary to eliminate Tramp Air issues. Once repairs are complete, Lipten Technicians will be back on-site to retune the boiler, and work with the client to establish routine maintenance procedures to ensure safe, efficient, and reliable future operation.

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Lipten Company is an Engineering, Procurement and Construction (EPC) firm that specializes in Central Energy Plant (CEP) General Contracting. Lipten also has a controls group that provides traditional and custom control solutions.

We provide steam generation, power generation, chilled water systems, compressed air systems, water treatment systems, controls and related Energy Center equipment and services. Our level of support can vary from an advisory role to complete turn-key facility construction. Services include: design, engineering, drafting (CAD), equipment specifications, procurement, installation, construction management, site audits, start-up, operator training and maintenance.