

New Lower Drum Coils Installed at Valent BioSciences

PROJECT CASE HISTORY

Plant Description

Valent BioSciences LLC (VBC), a wholly owned subsidiary of Sumitomo Chemical Company, operates a biorational product manufacturing facility in Osage, Iowa. The first purpose-built biorational manufacturing plant in the world, the facility supplies products derived from fermentation using locally grown agricultural raw materials.

VBC's plant utilizes two Babcock & Wilcox (B&W) industrial water-tube package boilers, each with 16 MW capacity and fueled by natural gas.



Project Challenge

The Osage plant team evaluated its need for steam and found it typically required only one boiler to operate at capacity. Utilizing only one unit would save fuel and maintenance costs; however, the second boiler needed to be ready for start-up on demand. From a cold start-up, considerable time would be required to warm up the boiler and could ultimately lead to over-heating and over-stressing of the unit's heavy-walled components.

Scope

- Heating coil assemblies, fittings, supports and hardware for two units
- Valves and steam traps
- Engineering, fabrication and training



B&W helped Valent BioSciences reduce fuel, costs and emissions with the installation of lower drum heating coils.

Solution

B&W designed and fabricated lower (mud) drum heating coils for both of VBC's industrial boilers. The coils allow the auxiliary, idle unit to maintain a hot standby condition using steam from the operating boiler.

This circulation of steam through heating coils offers a number of advantages:

- Reduces fuel usage
- Reduces start-up time
- Prevents unit from freezing during cold weather conditions
- Prevents low temperature corrosion resulting from sulfur and vanadium contained in some fuel oil ashes

Direct heating methods typically result in uneven heating, causing differential expansion problems within the unit's pressure parts, and can also cause water quality issues. The use of heating coils avoids these issues by evenly distributing heat within the mud drum and keeping the heating fluid and boiler water separate.

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Results

Following successful installation of the lower drum heating coils, the plant was able to maintain the second boiler in a hot standby condition using steam from the operating boiler (see Fig. 1).

Since the idle boiler no longer required natural gas to remain pressurized, the plant was able to achieve significant fuel savings. In the first quarter after the installation of the heating coils, the plant saw a 49 percent decrease in natural gas usage compared to the same quarter the previous year.

In addition, the plant saw a reduction in CO₂ emissions levels of nearly 4,000 metric tons from the reduced fuel usage over the first 18 months.

Payback for the lower drum heating coil project was reached in less than one year.

For the fuel, financial, and environmental benefits achieved, Valent BioSciences was recognized by its parent company, Sumitomo, in an award program focusing on Sustainability.

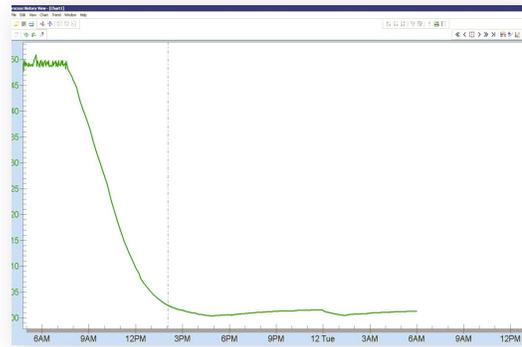


Fig. 1: Test results show the coils maintaining pressure (~100 psi) with one boiler out of service.

- ▶ Reduced fuel usage
- ▶ Increased flexibility
- ▶ Less maintenance
- ▶ Lower emissions
- ▶ Significant cost savings

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