EasiHeat Packages 'Green' Pharmaceutical Plant's Hot Water Production

Spirax Sarco, Inc. often receives credit for upgrading virtually all aspects of a facility's operation—energy and water consumption, return on investment, reduced footprint, uptime, maintenance costs, controlled heating output and emissions reduction—without tradeoffs. A Mid-Atlantic pharmaceutical manufacturing company recently found this out, thanks to the aid of a Spirax Sarco customer solutions team.

The pharmaceutical plant generated and stored hot water in two large, concrete lined storage tanks with integral tube bundles that were sized to meet the facility's calculated demand plus provision for peak demand. The storage tanks not only leaked but also sustained repeated tube bundle failure causing the operator to dump the condensate to grade.

The dumping practice was necessary upon detection of a tube failure to prevent untreated municipal water from upsetting the boiler feedwater system and potentially damaging the boiler heat transfer surfaces. This stop-gap measure raised the consumption of treated makeup water; fuel used to heat feedwater and feedwater treatment chemicals. The plant utilities managers decided an upgraded hot water system was an economic and environmental necessity.

Among the constraints connected with an upgrade was space in the boiler room. A stipulation for the upgrade was that the replacement equipment be compact, as well as efficient and able to instantaneously meet the demands of the domestic hot water supply system.

Once Again, Less Is More

The plant utilities project team members called upon their local Spirax Sarco, Account Executive Dave Walter for advice and recommendations. A team of Spirax Sarco engineers headed by Walter and Chas Bloxsome surveyed the site and delivered a proposal for a sequential installation of two skid-mounted steam to water heat exchanger packages (EasiHeat). They explained how the Spirax Sarco upgrade strategy would provide:

- Improved energy efficiency and fuel cost savings
- Tight temperature control
- Minimal hot water supply interruption during installation

- Removal of inefficient, heat-radiating large storage tanks
- Reduced potential for Legionella pneumophila bacterial contamination of the domestic hot water supply

The Spirax Sarco survey also concluded that additional energy savings and operational improvements could be obtained by upgrading the existing steam supply line capacity, which was insufficient to operate both units at full load conditions.

The Value of Customer Trust

Because of the plant's longstanding trust in Spirax Sarco knowledge, service and products, no competitors were consulted. Closing the sale involved only four

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meetings, plus hosting the customer team at the Spirax Sarco Mid-Atlantic Training Center to demonstrate the live-steam operation of an EasiHeat unit. With a careful explanation of the magnitude of wasted energy required to continuously maintain the storage tanks' temperature, the customer project team was convinced without need to present a detailed economic model. The managers approved all design drawings and the scope of work as presented.

Two EasiHeat modules were fabricated and delivered on-site. A team of five sub-contractor personnel under the supervision of Spirax Sarco Project Manager Chas Bloxome completed the project within the scheduled timeframe. Throughout the duration of the project, the Spirax Sarco Services Management Team worked closely with the installation contractor and customer when starting up all key pieces of equipment.

More Hot Water For Less

The plant obtained several benefits from the hot water system upgrade:

Smaller footprint: Both compact units fit on one pad, or half the space occupied for the same duty.

Improved safety: Removing the hot water tanks also removed a potential source of Legionella pneumophila bacterial growth within the domestic hot water system.

More complete utilization of latent heat: The EasiHeat heat exchangers run under vacuum, exchanging more heat to the domestic hot water and eliminating flash steam piped through the condensate pump and vented to atmosphere.

Economical load-following: Running the EasiHeat exchangers under vacuum and extracting more heat from the input steam enables the plant to follow baseline heating load with only one unit. The operators have been able to configure the two units in a "lead/lag" mode, with the "lead" unit meeting the baseline load. If increased hot water demand causes the hot water outlet temperature to fall by 5ºF, the "lag" unit comes on line. To equalize operating time between the two systems, the plant alternates "lead" and "lag" systems weekly.

Cooling water savings: The blown-tube exchangers discharged 30 gpm, or 1,000 lb/hr of hot condensate to grade. Before this hot water could enter the municipal sewer system, sanitary code required its temperature be reduced to 140ºF, which required additional municipal cold water consumption.

Satisfied Customers Pay Off

Building customer trust in a qualified technology partner like Spirax Sarco pays off in so many ways…for both parties. A shorter sales cycle keeps both parties more productive. A knowledge-enriched technical solution benefits the customer in unanticipated as well as predicted ways. Many of the "green" benefits of our work tend to fall in this category.

Trust also leads the customer to charge us with more of the project scope, with the attraction of reduced-risk, single-source responsibility. And for Spirax Sarco, it means more business with higher margins flowing from value-added services. That's a bright future we can all live with.

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