

## Quick Fixes Can Save Energy

### Some uncommon practices can help reduce plant costs

Certain steps that can markedly cut energy use don't get the attention they deserve. These "quick fixes" usually involve isolated equipment or problems that were given unique solutions. Check out these innovative ways to reduce plant energy cost.

*Dual drive pumps* – Some plants sometimes vent excess low-pressure steam when the system is unbalanced. Because these plants seem to have unstable steam generation, sending this steam to a stand-alone electric generator or using it in a process isn't possible. However, consider hooking up a steam turbine to a pump where a motor is a primary driver. Set the dual drive so that the steam is used to drive the pump when available and the electric motor will kick in when the steam can't produce the needed drive. This system works great especially on cooling systems where three or more pumps are used.

*Variable speed motors* – During the 1980s, variable speed motors got a bad rap. They were a maintenance nightmare and never quite worked as expected. Improvements have made them a lot more desirable. Energy cost for a spillback loop or nearly closed pressure valve is one of the most hidden costs on the process unit. A reliable variable speed motor can save big bucks on electric bills.

*Water/glycol systems* – Getting correct cooling in summer is essential to keep rates at maximum. Many plants are cooling limited not because of insufficient water temperature, but due to fouling on overhead exchangers, which reduces capacity. The main culprit is high inlet temperature, which can destabilize the water and allow certain contaminants to coat the tubes. Fin-fan cooling before the water cooler to allow the process temperature to drop to a safe level may be inadequate or your process may not have this design and a retrofit would prove very costly. Install a water/glycol system. This closed-loop system replaces cooling water where there's waterside fouling. The glycol allows contaminants to stay in solution at elevated temperatures. The water/glycol is cooled with fin-fans or cooling water at a location near the unit. Higher feed rates and less exchanger cleaning downtime easily pays for the electricity to run the system.

*Automated blowdown systems* – They can be used in two completely different applications and yield great benefits. The first is for cooling water towers. To prevent solids' build-up, purge cooling water from your cooling water system while adding fresh water. In many places an operator, who also controls the chemical additives, does this. The balance between adding chemicals and purging water is critical as too much blowdown requires additional chemicals while too little can cause exchanger and system fouling. Install an analyzer that controls the purge and chemical additive. This saves money on chemicals while ensuring your system is constantly protected.

The second location is at your boiler feed water system. Boiler feed water blowdown removes water impurities that can buildup in your system. However, too much purge costs water and energy. A simple conductivity cell hooked up to the purge valve reduces wasted purge while protecting your system.

*Low BTU sweep gas* – In many systems containing flares, sweep gas prevents oxygen from entering the system. For safety, many plants use natural gas for sweep because using an inert gas can prevent the pilot flame from staying lit. However, natural

gas is very costly and most flare systems only require a low BTU sweep gas. Use a 50/50 natural gas/nitrogen mix. In most areas, nitrogen, on a volume basis, is cheaper than natural gas. So, replacing half the natural gas with nitrogen reduces energy cost. The mixture is still above the minimum BTUs needed for a flare system.

*Wireless sonic leak detectors* – There are two locations where they can save a bundle. The first is on high-pressure steam systems, where a leaking steam trap can waste steam and pressure up your condensate system, which causes problems in equipment. The second is on remote flare relief valves or remote steam traps where routine checks aren't possible. These wireless systems will alarm when vibration occurs in the flange connected to the trap or relief valve. The vibration detects flow and the amount of vibration can measure quantity. These systems are costly for routine trap management but can provide a real savings for your most critical equipment.

Most of these innovative solutions are just starting to catch on in the plant system. Check with your various vendors if one of these will work for you.

GARY FAAGAU, Energy Columnist [Please make sure this is corrected if it's in the template]  
GFaagau@putman.net

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