Making the right decisions on water strategies can improve ethanol plant operational effectiveness

Know your limits

Andrew Ledlie, biofuels marketing manager at Solenis

Maximising operational effectiveness is as important to ethanol plant managers around the world as it can be challenging. Their efforts may include water-centric strategies, such as minimising water use, reducing or eliminating discharge or finding ways to reduce water-related operating costs.

Andrew Ledlie, biofuels marketing manager for Solenis, a worldwide leader in providing solutions to water-intensive industries, often consults with ethanol plant managers on the state-of-the-art technologies and processes that help them achieve their water-related performance goals. He recently shared his thoughts with *Biofuels International* on the best approaches to take – and the pitfalls to avoid – as ethanol plant managers address their water issues.

How important is it for ethanol plants to reduce water use or eliminate discharge?

Dealing with water issues is very important and much of it is linked to regulatory compliance. As water use and discharge limits become more stringent, it's more challenging for ethanol plant managers to meet them. Often, the tighter the regulations, the greater the challenge.

But regulatory compliance is just part of the story. As an ethanol industry observer, I know that many plant managers want to make their water use more efficient and effective because it's the right thing to do for the communities where they live and work. Think about US ethanol plants, for example. Many of them are located in the farm belt, where water for irrigation is vital. They know that the less water they divert for ethanol production, the more will be available for farming. That benefits the entire community.

Are there certain strategies that have proven more successful than others in helping plants reduce their water consumption? What are some of the positives and negatives of these strategies?

One common strategy is to reuse water that would normally be discharged, filtering or pre-treating it and bringing it back to the process side or "front end" of the plant. This can reduce both water demand and water discharge, but there is a downside.

Take, for example, cooling tower systems. Prudent plant managers should use a variety of chemicals to protect them from the harmful effects of scale, corrosion and bacteria. Plant managers who don't provide this protection risk losing cooling capacity, which results in lower ethanol production, higher electrical costs, a larger carbon footprint and ultimately higher expenses to repair or replace the cooling tower and associated piping and heat exchangers.

The problem occurs when the cooling tower water is directed to the process side of the plant. While this is a significant volume of water that can be reused, many cooling water treatment products aren't suitable to end up in distillers grains or are harmful to yeast. So, reusing this water greatly restricts the choice of chemistries available to protect the cooling system.

Can you cite an example of where applying the right strategy is enabling a plant to operate more efficiently and effectively?

Recently, one of our US customers was very intent

Solenis's OnGuard 2-plus control system allows plant operators to do real time, in situ performance monitoring on cooling systems, ensuring that process changes made to improve water or carbon efficiency do not result in negative side effects

on making measurable, verifiable improvements in the performance of their plant's cooling tower. Since they weren't diverting tower blowdown to the process, the door was open for the innovative microbiocide technology and performance-based monitoring and automated control system that Solenis is known for delivering.

The process began with a fairly detailed audit to understand how the plant was running and how its water was being managed in order to determine if there was an opportunity for improvement. The audit included inspection of the plant's cooling towers and heat exchangers and a review of equipment inspection reports, as well as a walkthrough to review the plant's layout, its water balance and discharge requirements. The audit clearly showed the potential for improving cooling system performance.

The plant manager opted to use Solenis Biosperse XD3899 Micriobicide technology to penetrate biofilms and better clean the system and minimise copper corrosion. The Solenis OnGuard system was also implemented to monitor scale, corrosion and biofilm control in real time and verify the performance improvements the customer was looking to make.

What was the outcome for the plant?

The results have been impressive. There has been a 90% reduction in chiller use so far this summer, in part because the system has been kept free of efficiency-robbing biofilm. That's critically important because cooling systems account for up to one-third of an ethanol plant's electricity use. Reducing a chiller's use by 90% can significantly reduce electricity costs and also reduce the plant's carbon footprint.

In addition, the OnGuard monitoring system enables the plant to reduce the amount of chemical needed, because it tells them how much chemical is necessary to meet their performance objectives.

'There are always new and better ways for ethanol plants to operate more efficiently and effectively'

Andrew Ledlie, biofuels marketing manager at Solenis

Is there a final thought you'd like to leave with readers?

Be open to innovative ideas and new technologies and have realistic expectations when implementing water-related strategies. There are always new and better ways for ethanol plants to operate more efficiently and effectively, but it's critical that plant managers carefully consider the broader implications of the strategies they choose. ●

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