

Global Colocation Data Center Improves WUE and Reduces Greenhouse Gas Emissions with Water Reduction, Reuse and Recycling Program



BACKGROUND

When used responsibly, water can play an important role in advancing corporate sustainability goals. When a business reduces water consumption in their operations, they often yield related savings in energy, CO₂ emissions and other areas that come with heating, cooling, moving and treating said water.

A global colocation data center operator sought to improve water usage efficiency (WUE) at their Singapore site with one important caveat: The site must maintain cooling system performance through effective protection against scale, corrosion and microbiological growth. The facility was using NEWater, a highly treated reclaimed wastewater produced by Singapore's Public Utilities Board (PUB), as their cooling water make-up source.

The data center's cooling system was running cycles of concentration (COC) at seven and aimed to surpass that number. However, the customer's existing phosphoric acid-based treatment chemistry made their blowdown water less suitable for recycling via reverse osmosis (RO) due to high phosphate levels.

The customer approached Nalco Water for help. The team responded with a plan that followed the principles of 3R: reduce, reuse and recycle.

SOLUTION

First, the team focused on reducing water consumption through increased COC. A non-P corrosion and scale inhibitor was introduced to replace the customer's existing phosphate-based chemistry. The phosphate-free formulation offers strong protection against corrosion and scale across a broad range of pH, hardness and alkalinity. Such versatility enables cooling towers to run at higher COC with consistent protective performance even amid varying make-up water quality and operating conditions.

The non-P chemistry also reduces risk of calcium phosphate scaling cooling tower blowdown recycling processes such as RO. Moreover, non-P chemistry contributes fewer nutrients to fuel microbio growth in the cooling system and, upon discharge, lessens the risk of negative impact on aquatic ecosystems.

To help prevent white rust corrosion of the galvanized cooling tower basin, the plan called for 3D TRASAR™ Technology for Cooling Water along with a pH adjuster program. This pairing is designed to maximize system reliability, minimize unplanned downtime and optimize the life of cooling water assets.

ANNUAL SAVINGS



WATER

Reduced water consumption by
22,500 m³
per year



WASTE

Reduced effluent discharge
to save
22,500 m³
per year

VALUE DELIVERED

USD \$39,200
ANNUALLY

Next, the team addressed the customer's desire to maximize water reuse as part of their goal to improve overall water management and sustainability. An RO-based water recycling program was designed and implemented to collect and purify the cooling water blowdown for reuse as cooling tower make-up.

RESULTS

With the Nalco Water program in place, the site made major strides toward their performance and environmental targets:

COC and water savings: Conversion to non-P chemistry with the 3D TRASAR™ for Cooling Water program enabled COC to increase from seven to nine delivering 10,486 m³ in water savings. The RO-based water recycling effort has contributed an additional 12,096 m³ in annual water savings. Together, these water savings are valued at more than USD \$39,200 per year.

Asset performance: The customer saw no decrease in operational efficiency with the new program, indicating reliable control of corrosion, scale and microbio risks are maintained.



CONCLUSION

With a holistic perspective on water reduction, reuse and recycling opportunities, the Nalco Water program helped this colocation data center achieve their water-savings ambitions without compromising operational performance. In addition, the customer's reputation for sustainability is supported by minimizing the environmental impact of their wastewater discharge and avoiding related greenhouse gas emissions.

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