

**Case study:** Northeastern United States

# VIVID smart controller provides control of concentration, reducing water and chemical usage

An industrial plant in the northeastern United States was using clarified river water as cooling tower makeup (MU), making the conductivity of the MU subject to seasonal changes. The customer observed significant swings in tower water conductivity during testing, which required daily adjustments to the blowdown valve setting. These adjustments had a cascading effect of large changes in the cooling tower cycles of concentration and chemical residual buildup. Additionally, heat-load swings in the cooling tower caused the evaporation rate to increase.

To help combat these issues, a competitor's controller was installed. However, unreliable results, as well as the time required to do routine preventive maintenance (PM) and learn the complicated controller interfaces, resulted in a decision to abandon the controller and perform manual control instead. The customer considered upgrading to a better controller, but the CAPEX required to install multiple controllers was prohibitive.

Seeking a solution, the customer asked the Baker Hughes engineering services team to perform an audit, which identified multiple areas of possible energy savings. One item clearly identified as a cost-effective solution was the installation of a cooling tower controller. While the customer was hesitant because of the poor performance of the previously installed

control equipment, they agreed to a trial in hopes of benefiting from tighter control of the cycles of concentration.

Baker Hughes presented the VIVID™ smart controller as a complete solution, specifically designed for cooling water applications. Its quick installation required minimal changes to sample piping and electrical needs, and the intuitive touch screen graphical interface simplified routine PM. After implementing the new VIVID controller, the customer was able to reduce the scheduled monitoring from daily to weekly durations for each of the required water parameters. The plant saw 100% compliance of cycles after the installation, and the chemical residuals improved from only 34% in-range to 99% in-range. As an added benefit, they also saw a reduction in the corrosion rate from 3.6 mpy to 1.1 mpy.

The trial was deemed a success by the customer, as they were able to save energy from more efficient cooling tower operations, OPEX from reduced chemical residual swings, and CAPEX from leasing the controllers from Baker Hughes. Because of this success, the customer made plans to add the VIVID smart controller to all of the plant's cooling towers.

Contact Baker Hughes to see how we can help energize your water.

## Challenges

- Account for changes in conductivity of river water used for cooling tower makeup
- Eliminate need for daily blowdown valve adjustments
- Control changes in chemical residual buildup
- Overcome customer's hesitance for controllers based on past, bad experiences

## Results

- Reduced water usage by 14%
- Improved chemical control to 99% in-range
- Provided energy, CAPEX, and OPEX savings
- Improved corrosion rate by 70%