

Energy Solutions Company Cuts Client's Cost of Wastewater Aeration by 30 % with Dissolved Oxygen Control Systems

RESULTS

- 30 % reduction in energy consumption and cost of aeration basin operation
- Rapid payback on the installed cost of dissolved oxygen control systems
- Reduced wear on blower motors
- Abated proliferation of undesirable organisms



APPLICATION

Organic compounds in municipal and industrial wastewater are most efficiently consumed by microorganisms under controlled aerobic conditions, typically at dissolved oxygen levels around 2 mg/L (ppm). Insufficient DO can kill microorganisms, disrupt the treatment of waste, jeopardize discharge compliance, threaten the environment, produce offensive odors, and necessitate expensive and time-consuming biomass replenishment procedures. Excessive DO unnecessarily burdens mechanical equipment, supports unwanted biological growth, wastes energy and increases operational costs. In fact, 30 to 60 % of the energy consumed in a wastewater treatment process occurs in the aeration stage. According to the USEPA measuring and controlling DO can result in energy savings up to 50 %.

CUSTOMER

This publicly traded energy solutions company provides institutions and businesses with environmentally sound projects that increase energy efficiency, reduce energy costs and ensure reliable, high-quality power for critical operations.

CHALLENGE

A men's correctional institution with a population of approximately 4,000 in the southwestern United States was faced with the challenge of maintaining and upgrading an aging facility while attempting to manage new restrictions on budgetary spending. Also eager to comply with urgings from the state to conserve energy, facility managers commissioned a detailed assessment of energy usage and opportunities to reduce costs and consumption.

“Wastewater treatment facilities of all sizes can realize significant energy reduction and cost savings by effectively controlling dissolved oxygen in aeration basins. Informed selection of equipment supplier, measurement technology, mounting technique and maintenance strategy will maximize ROI.”

Project Manager



SOLUTION

The energy solutions company identified a number of viable measures such as installation of an energy management system and more efficient lighting schemes, winning a contract to manage a comprehensive energy cost reduction project.

The aeration stage of the facility's treatment of wastewater emerged as an important aspect of this project because blower motors had been set to run continuously at full speed to avoid the relatively severe consequences of insufficient levels of dissolved oxygen in the basins. This costly practice maintained excessive DO and wasted precious energy. To bring the process under control DO sensors mounted on ball floats were selected to optimize positioning for representative measurements in the large aeration basins. The 4 to 20 mA output from the analyzers provide feedback to VFDs (variable frequency drives), completing new control systems for the existing blower motors. Now, as DO levels drop, the blower motors are ramped-up. When DO levels are sufficient the motors are throttled-back, netting 30 % reduction in energy consumption and cost.

Emerson Process Management offers three distinct Rosemount Analytical brand DO measurement technologies, a wide variety of mounting options including automated cleaning systems, and analyzers with industry-leading diagnostic functionality.



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