

Intelligent Process Control Improvement Strategy to Shave and Save Energy

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ABSTRACT

Aeration in the secondary treatment process accounts for a significant amount of energy use in a wastewater facility. A plant operation strategy to manage these loads is critical to maintain budgets, reduce costs, and operate a plant in the most efficient manner possible. Based on typical electric bill structure including energy and peak demand, along with the major electrical loads and plant process controls, guidelines and considerations to develop an energy shaving and saving strategy for wastewater facility will be presented. The application of instrumentation and process controls to achieve automated process optimization to meet changing regulatory limits will also be discussed.

Project case studies will demonstrate the results that can be expected related to electrical energy savings and how to achieve these savings based on process improvement projects completed at various operational wastewater facilities. Through relatively low cost instrument and control upgrades to support process improvements such as DO control, NH4 control, and MLSS/SRT control to maximize process stability, a wastewater facility can save money. Project improvements resulted in reduction of energy by 10-30% and reduced peak demand charges by 10-20%. Project case studies include results and lessons learned from a full scale ICEAS® SBR in Green Lake, WI and a conventional activated sludge plant in Black River Falls, WI.

ABOUT THE AUTHORS

Daniel J. Sheldon, P.E. is a Senior Process Control System Engineer at Xylem Inc. with 29 years of experience in process system automation, controls, instrumentation, electrical, and software engineering in the Water/Wastewater industry. He is involved with software and advanced process control products for Sanitaire. He has a BS in Physics and Math from Carroll College and is involved with NCEES Software Engineering P.E. Contact: Daniel.Sheldon@XylemInc.com