OPTImaster^{TM} White Paper

Superior method for selecting optimum DO and SRT levels

This paper explores challenges associated with selecting optimum dissolved oxygen concentration (DO) and sludge age (SRT) set points. *OPTImaster^{TM}* software is a solution to these challenges because it automatically calculates these set points.

The role of DO and SRT in reducing energy usage and optimizing performance

Pumping pure oxygen or air to maintain necessary DO level in an activated sludge system takes a lot of energy, often more than 50 percent of plant's energy consumption. Increases of DO and SRT above optimum values lead to energy waste while reduction of DO or SRT below optimum levels may lead to deterioration of the performance of an activated sludge process. Therefore, optimizing the DO and SRT targets, often called set points, are important factors in saving energy and improving reliability.

DO and SRT Optimization challenges

The goal of an optimized DO set point is to maintain sludge settleability and effluent quality within required ranges at minimum energy input. Unfortunately, there are many challenges in determining an optimum set point:

- there are no formulas that reliably predict sludge settleability, non-settleable effluent suspended solids, and level of *Nocardia* foam
- the nitrification rate cannot be determined on-line unless effluent quality starts deteriorating
- activated sludge performance is subject to unpredictable short-term perturbations

The *OPTImaster^{TM}* solution

OPTImaster^{TM} is software, which provides daily recommendations for SRT and DO set points. The *OPTImaster^{TM}* solution is based on the fact that, most of the time, an activated sludge system exhibits similar performance under similar conditions.

OPTImaster^{TM} uses proprietary data mining techniques to search through historical plant data. *OPTImaster^{TM}* selects DO and SRT set points based on the activated sludge model and past plant performance; these set points minimize energy usage while maintaining the required effluent quality and reliability of operation.