Implementation of Solids Retention Time (SRT) Control in Wastewater Treatment

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ABSTRACT

Solids Retention Time (SRT) is a critical activated sludge design and operating parameter. The selection of an SRT has many consequences related to process performance, sludge production, and oxygen requirements. The traditional method for controlling SRT is to manually adjust the sludge wasting rate based on the food-to-microorganism (F/M) ratio or mixed liquor suspended solids (MLSS) concentration. The effectiveness of closed-loop control of SRT has been demonstrated in many locations. In addition to reducing variability in actual SRT other benefits cited include reduced foaming, improved sludge settling characteristics, improved performance of downstream sludge thickening, and fewer laboratory process control measurements. Automated SRT control is likely to be of great benefit for overloaded or nutrient removal facilities. However, a big reason that automated SRT control is not more widely practiced is that many operators and engineers fear that a malfunction or misapplication of the control system will lead to a process upset. A better understanding of the proper application of SRT control is needed.

A review of published information and the authors' experiences reveal how SRT control can be optimized for the most stable results. Control system design requires accounting for process dynamics, selection and location of instrumentation, and development of a control strategy. The basic components of an SRT control system include flow and level meters, online suspended solids sensors, and a PLC or microprocessor. The control handle is the waste activated sludge flow rate. The control structure and calculations differ among the various methods. Maintenance of the online instrumentation, including evaluation of data quality, has shown to be one of the biggest challenges.

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Dr. Robert Smith, BCEE, PhD is Applications Engineer – Wastewater at YSI. He provides technical and applications support for online instrumentation for use in monitoring and process control of wastewater treatment systems. He has been working in the municipal water/wastewater sector for over 25 years. Rob has a Ph.D. from the University of Cincinnati and is a Board Certified Environmental Engineer (BCEE).

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