

Sensing and Control Systems: A Review of Municipal and Industrial Experiences

The objective of this research was to assess and document state-of-the-art of wastewater treatment plant sensing and control systems to discover successful practices that can be replicated by other facilities interested in automating. The research was based on the literature, the experience of the project and advisory teams, and onsite surveys. The project focused on the best examples of applied sensors, control strategies, and computerized process control in wastewater treatment plants.

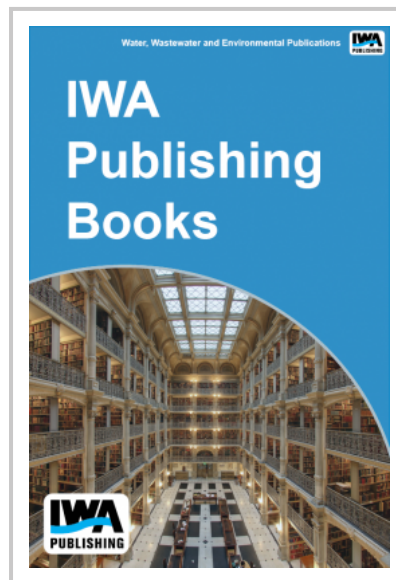
An instrumentation and control survey designed to assess the current state of automation showed that most instruments are used for the simpler measurements, and most respondents justified installing automation systems because of cost savings, though less than 10% of the facilities had data demonstrating these savings. In addition, the survey showed that wastewater treatment facilities that do use automation and remote monitoring during at least part of the day do achieve great cost savings.

The 25 field surveys done to gather site-specific details provided useful data on both successful and unsuccessful automation practices. The project team found a large number of control strategies not commonly documented in current literature. Critical components were documented, and when costs and savings were known, these values were also reported.

The report lists the 10 factors important for control system success, which resulted from factors identified by attendees at a WEFTEC 2000 workshop, combined with data from the field surveys. Almost all these factors relate to organizational and management rather than technical issues.

This report also identifies needs that must be met if the full potential of wastewater treatment sensing and control systems is to be realized. While some of these needs are technical, perhaps the most important need is for continued demonstration of the real-world benefits of automated control. Though this project identified many instances where automation has realized significant benefits, many more cases comparing the costs and performance of a WWTP before and after implementation of a comprehensive system will be needed to convince the wastewater industry of the future for sensing and control systems.

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