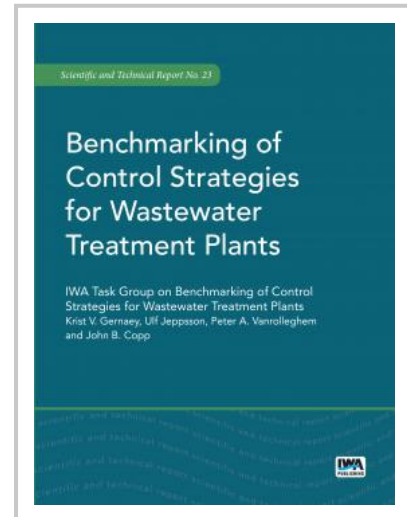


Benchmarking of Control Strategies for Wastewater Treatment Plants

Editor(s): Krist V. Gernaey, Ulf Jeppsson, Peter A. Vanrolleghem, John B. Copp

Wastewater treatment plants are large non-linear systems subject to large perturbations in wastewater flow rate, load and composition. Nevertheless these plants have to be operated continuously, meeting stricter and stricter regulations.

Many control strategies have been proposed in the literature for improved and more efficient operation of wastewater treatment plants. Unfortunately, their evaluation and comparison – either practical or based on simulation – is difficult. This is partly due to the variability of the influent, to the complexity of the biological and biochemical phenomena and to the large range of time constants (from a few minutes to several days). The lack of standard evaluation criteria is also a tremendous disadvantage. To really enhance the acceptance of innovative control strategies, such an evaluation needs to be based on a rigorous methodology including a simulation model, plant layout, controllers, sensors, performance criteria and test procedures, i.e. a complete benchmarking protocol.



This book is a **Scientific and Technical Report** produced by the [IWA Task Group on Benchmarking of Control Strategies for Wastewater Treatment Plants](#) [1]. The goal of the Task Group includes developing models and simulation tools that encompass the most typical unit processes within a wastewater treatment system (primary treatment, activated sludge, sludge treatment, etc.), as well as tools that will enable the evaluation of long-term control strategies and monitoring tasks (i.e. automatic detection of sensor and process faults).

Work on these extensions has been carried out by the Task Group during the past five years, and the main results are summarized in **Benchmarking of Control Strategies for Wastewater Treatment Plants**. Besides a description of the final version of the already well-known Benchmark Simulation Model no. 1 (BSM1), the book includes the Benchmark Simulation Model no. 1 Long-Term (BSM1_LT) – with focus on benchmarking of process monitoring tasks – and the plant-wide Benchmark Simulation Model no. 2 (BSM2).

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