Assessing the Operational Performance of Water Treatment Plants – Focus on Water Quality and Treatment Efficiency

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Abstract
A rigorous operational control of the water treatment component of a water supply system is crucial for the production of a good quality drinking water and for the protection of consumers' health. In addition, water treatment plants have to be managed in a cost-effective and sustainable way. Hence, operational performance assessment at plant processes level can greatly benefit its operation. This paper presents an objective-oriented, quantitative and standardized methodology for operational performance assessment, that applies specifically to drinking water treatment facilities. The methodology covers the aspects of water quality, treatment efficiency and operating conditions, and is based on performance functions that convert operational variables values into performance indices ranging from 0 (absence of service) to 300 (excellent performance). Exemplification is made, focussing on water quality and treatment efficiencies, by results of full scale case studies – two water treatment plants that have to manage strong seasonal variations both in water demand and raw water quality.

Keywords
Drinking water treatment; performance assessment; performance index; plant operation; treatment efficiency