Designing a Control Strategy to Automate a Solids Handling Process in a Municipal Wastewater Treatment Plant (WWTP)

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ABSTRACT

The Gold Bar WWTP, operated by EPCOR Water Services Inc. and located in Edmonton, Alberta, Canada, modernized its control system in 2000 and has continually been upgrading plant instrumentation. Reliable information and final control elements are now available to the Control Room Operators (CROs), better enabling them to make decisions and execute changes to the process with relative ease. The process dynamics are slow (having a time constant measured in hours); however, the process is continually changing with the diurnal inflows typical of a municipal WWTP. The plant is large (serving a population of over 800,000), and many processes must be continually monitored so as not to overwhelm any part of the plant. The CROs must remain vigilant in this regard. To improve plant operations, the Gold Bar automation department has been working with engineers from Dave Shook and Associates to automate control of the plant. This paper presents the control strategies designed to automate the plant's solids handling process. Based on best operating practices, upstream and downstream constraints and regulatory requirements, control objectives were developed and incorporated into the control strategies.

Briefly, describing the solids handling process: solids entering the plant are separated in primary settling tanks and then further concentrated in fermenters and thickeners before being transferred to anaerobic digesters.

As is discussed in the paper, the project faced some interesting control challenges, which were addressed by capitalizing on built-in control system functionality – moving average, high/low select and rate limiting function blocks are some examples of what was used to achieve the control objectives in the design.

ABOUT THE AUTHORS

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