

Efficient Control of Potable Water Distribution

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ABSTRACT

Service providers struggle to control potable water pump stations that are distributing to public consumer networks with varying demands while maintaining pumping efficiency, especially while the consumer points are physically located at different elevations. Many service providers have tried to introduce Variable speed drives to control the pump discharge and thereby trying to achieve energy efficient operations.

A DCS pumping station control system was designed based on flow; it utilizes local control system at selected points of the network (District Metering Areas) where a flow control valve is installed to control flow in addition to logging of other data like water quality parameters.

Utilizing mass balance were the summation of the actual flow at each DMA is used to manipulate the speed/number of running pumps so that the station outlet pressure is always kept at the exact value required depending on the demand at that instant of time regardless where the pumped water is consumed.

The system eliminates the need for different pressure head discharge headers in areas where consumer points are at different elevations and provides a built-in leak detection capability. Model Driven control can be achieved utilizing logged data collected from the network.

This efficient control system optimizes energy usage, limits water consumption and helps for faster detection and rectification of water leakage.

About the Authors:



Raed Al Nuaimi has been in design, construction and commissioning of control systems serving refineries, power plants, water and waste water facilities for over 25 years. He is currently heading the Instrumentation and Control Department at AECOM Middle East Ltd. in United Arab Emirates. He is also the Honors & Awards chair of ISA UAE section.



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