

Optimizing In-line Booster Pumps with Unique Design Features and Control Strategies

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FORMAT

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ABSTRACT

As water distribution and wastewater collection systems extend their reach, additional pump stations are added as hydraulic conditions require. Re-pumping at key locations within the system is often necessary, especially in larger systems where there is little topographic relief. In-line booster pump stations are used where the installation of a storage tank is undesirable due to limited space, odor, and/or aesthetic concerns. Without a storage tank to buffer incoming flow, in-line booster pump stations must be designed to accommodate a wide variety of hydraulic conditions that can vary rapidly and significantly. Multiple variable speed pumps and modulating control valves are typically provided to achieve the desired range of operational conditions. Successful in-line booster pump station control strategies are based on a keen understanding of the hydraulic requirements and the limitations of the controlled equipment. Advances in pump station design and control strategies can assist in optimizing operations, lowering energy usage, and avoiding excessive equipment wear.

This presentation will review the hydraulics of common water and wastewater in-line booster pump stations applications, key process measurements, and control strategies that result in fully automated and reliable operation. Techniques for enhancing reliability and efficiency of the systems will be discussed. Examples of in-line booster pump station designs will be presented highlighting various control strategies and design options that have been successfully implemented.

Attendees of this presentation will obtain a better understanding of in-line booster pump station design and hydraulics, and will be able to identify control strategies that balance performance, efficiency and reliability.

ABOUT THE SPEAKER:

Evan Curtis, PE has nearly 20 years of experience in the design, construction management, and commissioning of water and wastewater instrumentation and control systems. Mr. Curtis graduated with a Bachelor of Science in Civil Engineering with a Minor in Environmental Engineering from Carnegie Mellon University in 1994. He began his career at Hazen and Sawyer in 1994 as a water/wastewater process

engineer and now focusses on instrumentation and controls. Mr. Curtis is currently an Associate at Hazen and Sawyer serving as lead instrumentation engineer on large multi-disciplined design projects as well as project manager on projects which predominantly involve instrumentation or SCADA.