ABSTRACT for the 2015 ISA WWAC Symposium

On Demand Pump Condition and Optimization

Jeff M. Miller[1]*

[1]Schneider Electric, 8001 Knightdale Blvd., Knightdale, NC 27545
(*Email: JeffM.Miller@Schneider-Electric.com and Phone: 919-266-8360)

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ABSTRACT

This presentation discusses new automated pump assessment technologies and how they can dramatically reduce energy costs and equipment wear beyond traditional methods. Examples are used to explain concepts (PHI, specific energy, affinity laws) while showing benefits.

New automation technologies in dynamic pump optimization and on-demand condition assessment have taken energy management a step further by allowing the true health and efficiency of a pump or set of pumps to be known in real time. Previously these types of systems could only be implemented cost effectively on an entire distribution system and still used static data, but newer technologies allow these systems to be implemented cost effectively on a pump-by-pump or pump station basis in the collection, distribution, or treatment systems.

Pump and specific energy curves are measured and calculated for hundreds of different pumps, pump combinations, pump speeds, and operating conditions allowing the best selection of pumps and operating points to be used to drastically reduce energy costs. In addition, real time pump data allows pumps to continually be operated in their preferred operating range preventing shifts over time that could lead to excessive equipment wear due to pump vibration and cavitation.

Pumps are often operated to failure or severe wear with the thinking that we are getting the most out of them, but this does not consider the true costs associated with pumping (e.g. energy wasted by worn or damaged impellers, degraded motor windings, and other conditions). As a pump wears over time its efficiency is compared to the designed factory efficiency of the pump. A Pump Health Index (PHI) is calculated by comparing the current verses the factory efficiency as well as the energy being lost by a worn pump. Management and maintenance can now see real time the cost expressed in dollars of not reconditioning a pump.

ABOUT THE AUTHOR

Jeff M. Miller *is a Water Solutions Architect for Schneider Electric's Water Wastewater Competency Center. Jeff has a B.S. in Electrical Engineering and has worked as an engineering consultant and systems integrator for 25 years where he has delivered on over 30 wastewater treatment, 25 water treatment and 45 pump station projects ranging in size from small lift stations to 370 MGD treatment plants. Jeff is the co-founder and past chair of the NC AWWA-WEA Automation Committee and is also an active member of several national and regional Automation and Plant O&M related committees. Contact: JeffM.Miller@Schneider-Electric.com.*

ABOUT THE PRESENTER

Brian Hinkle *is a Business Development Manager for Schneider Electric's Water Wastewater Competency Center. He has spent more than 20 years providing electrical power and automation solutions in the water industry and a variety of other markets. He currently resides in Jacksonville, Florida and works with municipalities and consultants in Florida and Alabama. Brian has a Bachelor of Science degree in Electrical Engineering from the University of Cincinnati and is a current member of ISA and the Florida Section of the American Water Works Association. Contact: Brian.Hinkle@schneider-electric.com.*