

# Application Note - Water/Wastewater Industrial

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Industrial operations – oil and gas, mining, solar, nuclear, chemical, pulp & paper, food & beverage, agriculture – use tremendous amounts of water. Water is used in thousands of processes including cooling, drilling, dust control, screening, mineral extraction, settling, conveyance, slurring, dilution, flocculation/deflocculation, etc. The processes include the removal or procurement of the water, the consumption of the water, and the discharge of the water.<sup>i</sup> Organizations that manage their water costs and production opportunities benefit from:

- Monitoring water use efficiency and auditability.
- Analysis of the cost of water versus the operational benefits.
- Understanding the environmental stress associated with procuring water.
- Recycling and reusing water.
- Reducing energy consumption and costs to produce, consume, clean and discharge water.
- Ensuring regulatory compliance and integrating constraints.

Many industrial operations discharge elevated levels of toxic chemicals and hazardous waste in the form of wastewater.

- Oil and gas facilities can discharge elevated concentrations of bromide.
- Hydraulic fracturing for natural gas generates flowback and produced water that contains scores of chemical.
- Mines produce slurries that can contain haematite, surfactants, oils, zinc and arsenic.
- Food processing plants can emit high concentrations of suspended solids, particulate matter, and organic material.
- Paper mills generate suspended solids and inorganics.
- Chemical plants – petrochemicals, pharmaceuticals, pesticides, plastics – release organic compounds and by-products.
- Agriculture operations discharge various organic chemicals.

Industrial facilities either process their own wastewater or work with third-party or municipal wastewater treatment plants. The wastewater treatment might include active sludge, oil and grease removal, trickling filtration, brine treatment, and anaerobic reactors. The industrial design firms responsible for facility design and/or construction, such as [AECOM](#), [URS](#), [Jacobs](#), [Fluor](#), [CH2M HILL](#), [AMEC](#), [Bechtel](#), [Tetra Tech](#), [KBR](#), [Parsons Brinckerhoff](#), [HDR](#), [ARCADIS](#), will include industrial wastewater treatment capabilities as part of the initial designs or retrofits. These wastewater system designs specify a great deal of instrumentation and control equipment, including PLCs, HMIs and PCs.

When firms design new facilities or retrofit existing ones, the instrumentation, controls, SCADA and operator interfaces must be specified. In retrofits, the technical recommendations are often based on the incumbent equipment and systems. In new or expanded facilities, the specifications tend to be along the lines of the “typical” manufacturers and brands. This may simplify operations, but the status quo may be more expensive and based on dated technology.

In new construction, the instrumentation and control specifications are based on a combination of the plant owners and the engineering firms’ preferences coupled with the types of facilities and local laws. The wastewater treatment facilities are designed to be around for decades. Designers and engineers serve the interest of the facility owners by specifying what is technically



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AN1985

November 2013 - Jeff Hayes

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required, not items based on historical solutions. Manufacturers play a key role in the technology selection but should be weighed against the total, long-term costs of the systems – capital, maintenance, longevity, energy consumption, operator efficiencies, etc.

As consumers of instrumentation and control equipment, facility owners have direct control over the manufacturers and models that get deployed. However, the incumbent brands may be insufficient for the goals of the owners because:

- Costs tend to be higher for brand-name products versus functionally-equivalent or better, non-brand-name products.
- Incumbent components may not be based on the latest proven technology.
- Operator efficiencies may not be achievable because of dated technology.
- Large manufacturers may be good with some product lines but poor in others.
- Technology may not be optimized for the evolving deployment and application requirements.

The equipment manufacturers would prefer the flexibility of meeting stated specifications because this gives them the ability to:

- Have greater control over their brand and their offering's overall appeal and marketability.
- Get more favorable component pricing.
- Provide a more robust and feature-rich product.
- Leverage the latest innovative technologies and capabilities.
- Ensure a more synergistic product offering by packaging a superior product made from superior components.

Many industrial environments can place a heavy burden on the instrumentation and control equipment. Unless manufacturers design their products to operate in industrial environments, the products will be prone to unreliability, failure and short lives. If the technology will be deployed in the outdoors, direct sun, wet, dusty, high-vibration and explosive environments; e.g., hydrogen sulfide, methane, ozone, chlorine, then the facility's electronics need to match.

For over 30 years, Beijer Electronics has designed and manufactured human machine interface, industrial panel PCs, automation software, and industrial networking switches, routers and converters. Beijer offers products for most industries but tends to focus on environmentally-challenging industries including water/wastewater, oil/gas, mining, heavy construction, marine, off-shore, transportation and industrial vehicles. The products are design to excel in environments prone to extreme operating and storage temperatures, water, humidity, dust, chemicals, combustion, high vibration, physical shock, and electrical interference. Beijer has shown industrial organizations that its delivers:

- A rugged broad product line for most size, connectivity, performance and price requirements.
- Excellent product quality, immediate product availability, and reliable technical support.
- Software that provides solid functionality and protocol support, state-of-the-art graphics, smart design and engineering tools, and an open platform.

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<sup>i</sup> "Water Accounting for (Agro)industrial Operations and Its Application to Energy Pathways;" J Schornagel, F Nielec, E Worrellb, M Böggemannd; Resources, Conservation and Recycling, Volume 61, April 2012, pages 1-15;  
<http://www.sciencedirect.com/science/article/pii/S0921344911002783>



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