

# Technical Article

## Three Tips To Optimize Cooling Water Management For Lower Plant Operating Costs

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Evaporative cooling towers are key components in the effective operation of plants in the electric power, industrial process and manufacturing industries. They also are essential in the heating, ventilation and air conditioning (HVAC) systems that provide climate control in large facility complexes, such as educational and corporate campuses; casinos, hotels and convention facilities; data centers, and government, research and medical buildings.

The proper control and treatment of cooling water is essential for efficient, safe and economical operations. Chemicals are fed to these systems that protect against fouling, corrosion and microbiological contamination. The proper dosage of these key chemicals is determined by having accurate information on the system make-up and blowdown water.

To achieve effective cooling through the cooling tower, it is necessary to maintain proper design flow through the cooling tower and thus provide adequate cooling of the system. Insufficient cooling water can affect critical equipment or building climate control. Accurate flow meters are the most effective tool to achieve reliable flow results and control system costs.

Here are three ways to optimize cooling water management with flow meters:

**Tip 1:** Install a flow meter at the plant water intake source, which can turn the meters on the blowdown and make-up water lines into sub-meters. Comparing the flow data on all three lines helps identify potential water leaks and determine the system water balance plus other system issues.

**Tip 2:** Install flow meters upstream from pumps to provide flow data alerting the system to low flow situations leading to potential pump problems caused by low flow conditions. Otherwise, the result can be expensive pump repairs or even system shutdowns.

**Tip 3:** Accurate flow information collected from both the blowdown and make-up water lines can be used to calculate rates for evaporation, cycles of concentration and cooling water chemical treatment rates.

Tracking these related factors is important to the assessment and improvement of a system's water treatment program. For example, maintaining the highest cycles of concentration can offer significant savings on cooling water treatment costs. Having accurate blowdown and make-up flow rate data is essential in achieving this goal. The flow data translates into savings on chemicals, sewage fees and associated energy costs related to cooling water usage.

### Flow Meter Technologies

Different flow meter technologies have their advantages and disadvantages, depending on the fluid and application. Cooling tower and HVAC systems require the ability to measure flow to +0.5% accuracy in high temperature conditions, where real estate for instrumentation is tight, and low maintenance and long life are essential.

McCrometer's FPI Mag® Electromagnetic Flow Meter meets the accuracy requirement in water for cooling

tower service with its accurate sensing across the full diameter of the pipe. The meter installs without cutting pipe, welding flanges, de-watering lines or interrupting service. This reduces installation time and costs by up to 45 percent over traditional full pipe flow meter installations.

## Conclusions

When choosing a new or replacement flow meter for service in cooling tower systems, be sure to consider the meter's accuracy, ease of installation, maintenance requirements and life of the instrument. Flow measurement at multiple points in cooling tower and HVAC systems is a best industry practice to minimize: water consumption, energy expenses, the cost of water treatment consumables and repairs to pumps and other equipment.