

DECENTRALIZED WATER TREATMENT:  
**SAFE, EFFECTIVE  
WATER CONDITIONING  
IN COOLING TOWERS**

**GRUNDFOS ISOLUTIONS** | A SMART SOLUTION FOR YOU

**MOST PEOPLE UNDERSTAND COOLING TOWERS ARE ESSENTIAL TO INDUSTRIES AND COMMERCIAL BUILDINGS. YET, THEY ONLY THINK ABOUT THEM WHEN A BREAKDOWN IMPACTS A PRODUCTION PROCESS OR THE INDOOR TEMPERATURE ON A HOT SUMMER DAY.**

Located in a dark corner of the premises, cooling towers put out signals that are typically not addressed, which can result in huge losses. When performing optimally, cooling towers can help reduce the overall water and energy footprint of the facility or building.

One Grundfos customer has identified a Grundfos solution as the right choice for solving its challenges related to water treatment in cooling towers. The solution is currently in the planning phase.

**Cooling Tower Issues Affect Water Efficiency and Safety**

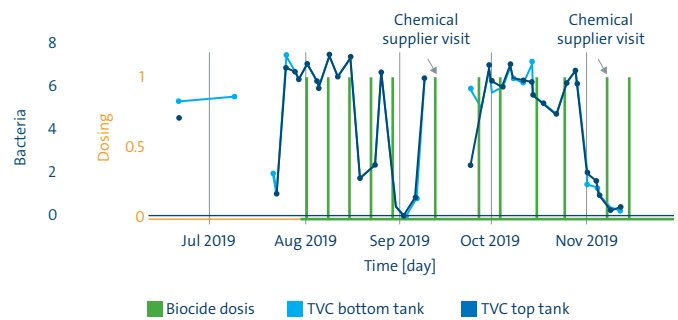
A European metal-mechanic company was experiencing challenges within its daily operations. The production supervisor determined something was wrong with one of the cooling towers, which was in a building several hundred feet from the production line. He and the facility manager analyzed the situation, which was more complex than he imagined.

In addition to the production supervisor and the facility manager, there were several other stakeholders, including the building's outsourced maintenance company and the chemical supplier, and they were not aligned.

Even with onsite manual supervision and operation several issues still occurred. Some of the issues the group discovered included the following.

**Manual Disinfection**

The hoses for the addition of biocide were either empty or full of air, causing faulty dosing. As a consequence, the bacteria count was double the recommendation of the chemical supplier. Since the supplier only visited the site 10 times per year, he was missing bacteria fluctuation peaks between visits.



*Correlation between ineffective biocide dosing and cell count*

**OPTIMIZE**  
OVERALL OPERATION

**REDUCE**  
CHEMICAL CONSUMPTION

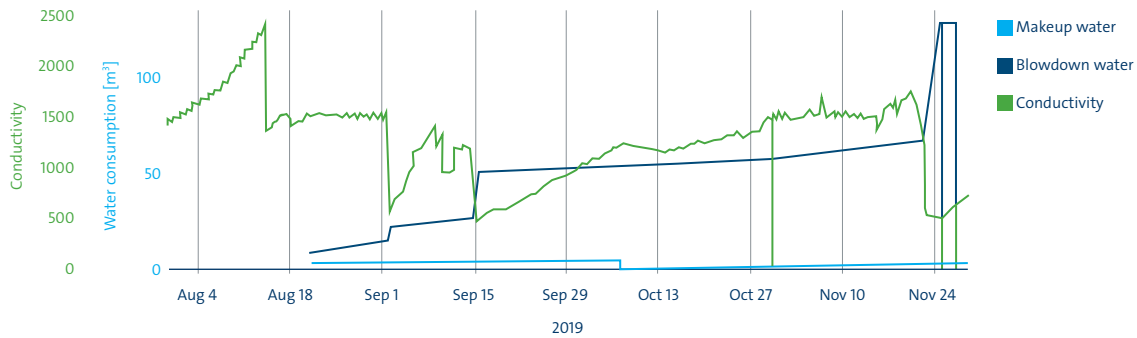
**SAVE**  
WATER

**Risk of Biological Contamination and Legionella**

Lack of bacteria control represents a high risk of fouling and a threat to human health. The outsourced maintenance partner added chlorine tablets to minimize this risk without informing anyone. Unfortunately, this was not enough to correct the problem. Adjustments were done without keeping a logbook, so it was difficult to be on top of the situation.

**High Water Usage**

As shown in the below chart, conductivity and water balance were unstable, affecting the performance of the system and increasing freshwater consumption. A make-up water valve was opened manually by accident, but not closed again. This led to one of the sump tanks constantly overflowing without monitoring, warnings or alarms for several days until the next routine check.



*Inefficient manual Blowdown control on site*

At another point during this period, one of the main supervising PLC's firmware was upgraded. After that, the make-up water was activated constantly by mistake for three consecutive days. Again, water was wasted. The company has a strong commitment to reducing its water footprint, so this was simply unacceptable.

**Resource-Demanding Compliance Reporting**

According to the facility manager, the company was also struggling with time consuming legal compliance reporting. The logging and tracking of data are done manually, which wastes a lot of time and creates a risk of inaccurate reporting.

**SOLUTION AND RESULT**

**Precise and Monitored Dosing**

Grundfos presented the facility manager with a newly developed intelligent solution. It combines several components including intelligent digital dosing pumps, a measurement and control device and a cloud-based remote monitoring system that connects the components. When he installs the solution, he expects to achieve smoother operations, better bacteria control, easier compliance reporting and water savings.

The newly developed Grundfos ChemPairing App will consolidate all the operational parameters in one place. The solution improves user safety by ensuring that only the right chemicals are used. It measures all system relevant data online, and produces compliance reports on request. It can also show warnings, stops and chemical status in real time, improving uptime. It will also send an SMS to the operator when he needs to refill the chemicals.

By measuring the conductivity, the Grundfos measuring and control system, DID, can react when the cooling water reaches a

critical dissolved solids content. This allows an automatic reaction to the blowdown and make-up valves, maintaining the water quality within optimal parameters and keeping water balance at optimal levels, without the need for manual operation. The device will also inform the chemical dosing pump of the right amount of biocide needed, avoiding over- or under-dosing, to keep the bacteria growth under control. At the same time, the Grundfos SMART Digital dosing pump, DDA FCM, and its integrated intelligent algorithm will prevent the inlet hose from filling with air or bubbles and will trigger an alarm in the system if it happens.

**Transparent System Information and Stakeholder Alignment**

With the Grundfos solution, all the information will be available for all stakeholders in the chain at any time. This will help align the facility manager, the maintenance technician, the operator and the chemical supplier and put them ahead of any trouble that may occur in the system. It will also help optimize overall operation of the cooling tower and improve control of water, energy and chemical usage.

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