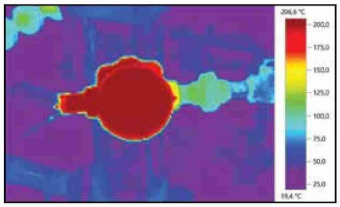
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# Optimise boiler water to cut costs

SAVING water is not only the next sustainability frontier, but an effective way to curb rising input costs. This is according to Chris Paterson, managing director of AES, a leading South African industrial steam operations and project company.



## PART OF THE SOLUTION

Saving water is complex, as every site and manufacturing process is different. AES therefore works closely with clients to better understand their water chemistry.

Not only does municipal water quality differ regionally, but companies are increasingly using boreholes to reduce their dependence on municipal water. However, water high in total dissolved solids (TDS), iron and silica is not suited for boilers.

"It depends on whether water is drawn from a clean aquifer. We have seen borehole water with very high TDS - and some which is better than municipal water. Companies intending to sink boreholes must get water tested and analysed. If iron or silica levels are high, additional investment is required to remove that. Borehole water also changes. You need monthly or even daily monitoring of the TDS," Paterson advises.

## PRE-TREATMENT AND WATER LOSS

All boiler types need to blow down to control the TDS inside, and ensure safe and stable operations. The majority of installations then route the resulting wastewater to drain.

To minimise blowdowns and save water, TDS must be monitored and reduced: "Do boiler operators know the limits at which they need to be operating? Do clients have the right automated blowdown equipment to ensure they are not blowing down excessively?" asks Paterson.

Where the TDS in water is high, companies often install reverse osmosis (RO) plants: "However, an RO plant comes at a cost of some 30% of the water being treated - which then goes to effluent. Only if you can use that higher TDS water somewhere else – maybe to flush toilets or water gardens – can you offset the water loss," he suggests.

AES commercial director Dennis Williams concurs, adding that even if a company uses this RO water elsewhere, the net water cycle across the RO and the boiler may still be more costly than municipal usage.

Williams notes that simpler solutions may exist, as shown when AES assisted a food manufacturer that switched from an electric to a biomass boiler: "AES changed the water preparation, replacing the RO plant with a simple water softener, resulting in a water savings of 25%," he explains.

## COUNTING ON CONDENSATE

Once TDS is under control, the focus shifts to boiler operations and returning condensate for re-use in boiler feedwater. However, client steam operations determine the quality and quantity of condensate. Importantly, the client's process and manufacturing plant design – for example, 'dead leg' piping which is not used and causing condensate wastage - also affects the percentage of condensate return.

"To understand how to maximise condensate return, steam users should measure the steam at critical points in the process. As many companies no longer have in-house skills to do this, AES adds value by conducting steam trap surveys or walking the lines to understand where steam is going, or to identify leaks," Williams advises.

Steam traps play a significant role in condensate management, he adds: "For a manufacturer using a heat exchanger, steam traps ensure that the heat exchange system is working optimally without steam wastage, or 'flooding' with condensate. Many of these condensate systems fail when steam traps are not sized correctly, not maintained or have been damaged by operators opening valves too quickly. This results in a rush of steam into systems, damaging the systems internally."

