GUARDIAN

Pre-commissioning - Air Hygiene - Water Treatment

#### Case Study: AOT Wallenius reduces bromine at a cooling tower





### The project

A system of small cooling towers needed to reduce reactive maintenance issues and avoid the use of too much bromine, which can effect system fabric by causing corrosion to steel. Non-chemical water treatment, Wallenius Advanced Oxygenation Technology (AOT), was installed to test its effectiveness compared with the existing water treatment regime.

The cooling towers had a history of erratic bromine levels, and therefore a lot of reactive maintenance was required to keep the system in control. This was caused by its lowvolume design, which meant the turnover rate of water was high, with settled water hardly remaining in the towers at any one time.

The dynamic changes meant that the usual dosing systems were found not to be sensitive enough to maintain sufficient levels of chemical dosing without an expensive, difficult to maintain system, or increased dosing to compensate.



# The solution

AOT was installed on one of the four cooling towers, with all other parameters left in place apart from the regular bromide dosing. AOT is a widely recognised non-chemical alternative, providing ecologically sound, high-tech water purification that has been proven to achieve 99.999% Legionella 'kill rates'.

The AOT treated system provided in-specification bacterial results all year round, including during the hottest periods of July and August, except for one blip when water softener failure caused lime-scale build up on the bulb. Once the bulb was clean, the system recovered quickly to acceptable levels without the need for chemical dosing. Monthly results for the 'traditionally' treated towers showed they were out of specification approximately four of the 12 months.





#### The outcome

Over a 12 month period the following results were recorded:

- Average TVC (Total Viable Count) at 30°C for the Cooling Towers treated with traditional chemicals = 31,314 cfu/ml
- Average TVC at 30°C for the Cooling Tower treated with AOT and no bromine = 6,239 cfu/ml

## **Savings**

• **Chemical savings:** Using AOT in the cooling towers demonstrated a 47% reduction in chemical costs for the year, compared with the other traditionally treated towers. This resulted in a cash saving of £3,000 per year.

Even taking in to account the annual cost of a replacement bulb, the net saving is still approximately 30% of the chemical costs. There was also a water usage saving of around 20%.

• Maintenance time saving: The AOT unit had one reactive maintenance issue in 12 months – due to the failure of the softener and the bulbs requiring cleaning. The bromine dosing systems had on average eight reactive maintenance issues each in the same period. Using normal charging rates with an average visitation time of two hours, this maintenance would have cost around £1,520.



- 47% reduction in chemical costs
- 20% reduction in water usage
- Reduced reactive maintenance
- Improved bacterial control

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