Water Technologies & Solutions
case study

petrochemical complex recovers contaminated ground water saving water & chemical cost

challenge

An Australian integrated petrochemical complex was under pressure to reclaim contaminated ground water, and reuse it within the complex. A water reclamation plant was commissioned, which recycled the water within the complex, including makeup to a number of cooling towers. An additional benefit of the project was the reduced dependence on municipal water.

There was concern that the cooling system performance may be compromised by the change in makeup quality. The challenge SUEZ faced was that the water would be lower in alkalinity and hardness - two parameters that provide natural corrosion inhibition. The water would also have higher Total Organic Carbon (TOC), which has additional concerns, including increased biological activity.

An adjustment to the cooling water treatment program was required to ensure that:

- Corrosion was minimized
- Scale was prevented on critical hot exchangers
- Cooling water cycles were optimized
- Cost effective chlorine based biocide program could be maintained despite the increase in TOC

solution

SUEZ developed a plan where the new lower levels of alkalinity and calcium were balanced with increased levels of corrosion inhibitor. Halogen Resistant Azole (HRA) was continued to protect against the Admiralty Brass corrosion in the presence of chlorine.

The SUEZ monitoring and control system (Paceseter* Plus) recognized the change in water quality and adjusted the chemical dosing appropriately.

While Sodium Hypochlorite remained the primary biocide, the use of a SUEZ chlorine resistant dispersant was important in keeping the new elevated levels of corrosion inhibitor in the solution.

The primary goal of the Continuum* AEC water treatment program was to maintain the very low corrosion rates achieved with the previous cooling water regime. This was critical due to the extended targets between plant turnarounds.

results

New cycle targets were established and the plant achieved its primary goal of reclaiming contaminated groundwater, while reducing its dependence on municipal water. There was no compromise in the corrosion performance of the cooling systems. The cost of water and chemical was reduced ~ $220,000/yr.

The increase in TOC in the makeup was managed such that there was no measurable change in biological activity within the system.

Through corrosion monitoring, it was observed that some towers could be over cycled despite being within the prior constraints of hardness, alkalinity and silica. Cycles were optimized based on corrosion rate measurement. SUEZ balanced the competing dynamics of increasing corrosion inhibitor rates, fouling on hot surfaces and found the right balance of chemical residual levels and system residence time.

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