Engineered water system for The London Clinic, UK

Healthcare | Case Study

The Client

Established in 1932, The London Clinic is the largest independently owned charity hospital in the UK.

Located in the heart of London's medical community, The London Clinic has over 250 beds, a 24 hour consultant-led intensive care unit (ICU), seventeen operating theatres including dedicated endoscopy suites and a new hybrid vascular theatre, a day surgery unit and three radiotherapy suites.

The London Clinic was the first hospital in the UK to have access to the Olympus Lucera Spectrum state-of-the-art endoscopy imaging system, which allows diagnosis of cancers and premalignant conditions at an earlier stage, therefore increasing the chances of survival.

Key Figures

- New water treatment system for endoscope reprocessing required
- Compliance with CFPP 01-06 and EN ISO 15883-1 & 4
- Restricted installation space

The Client's Needs

The capability for early diagnosis led to an increase in demand and The London Clinic needed to expand its existing endoscopy facility to provide more treatment rooms. At the same time it took the opportunity to upgrade the existing endoscope reprocessing equipment and the associated water purification equipment.

To maximise the availability of endoscopy, The London Clinic needed a continuous supply of high purity water meeting the latest regulatory guidelines of CFPP 01-06 and EN ISO 15883-1 & 4.

The problem was to find space for the new plant. A new plant room was created in the roof space but, because it was divided into small sections, it was very difficult to fit in a standard model water purification system.

The Solution

Veolia Water Technologies's solution was to install an Osiris 600 duplex purification unit, with each membrane rated for the full flow and each supplying a separate hygienic stainless steel ring main distribution system.

This system duplication allows sanitisation and routine maintenance with no downtime within the Endoscopy Department. Sanitisation is fully automatic using hot water generated within the Osiris.

The standard Osiris unit was fully customised so that the entire system could be manufactured on three precision engineered skids to fit into the plant room. The pre-treatment plant was designed to feed not only the Osiris units but also the direct fired gas water heaters, which supply hot water to the AER units.

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Process Description

Mains water is pre-treated by triplex base exchange softeners to soften the feed water so that the reverse osmosis modules can operate at high recovery and minimise waste water. This is followed by a carbon block filter to protect the membranes from chlorine attack and to filter the feed water to 5 micron prior to a break tank to comply with water regulations.

Each membrane has a dedicated feed pump and the permeate from the reverse osmosis modules is collected and stored in a stainless steel storage tank fitted with a heater to maintain the water at 60°C. The water is continually circulated from the tank through an ultrafiltration (UF) module to remove endotoxins to points of use. When the storage tank is full the permeate is recirculated back to the break tank to prevent stagnation in the pipework.

The storage tank, UF and distribution system is disinfected automatically by increasing the temperature of the storage tank to 90°C, maintaining this temperature for a preset period and then allowing it to cool. This routine procedure ensures consistent compliance with TVC and endotoxin requirements without the need for chemical disinfection and its associated difficulties.

Results

In spite of access difficulties which required crane lifting of the skids to the 8th floor, the plant was installed on programme within the restricted space available. Helen Bigley, Manager of the Hospital Sterilisation & Disinfection Unit, is impressed with Veolia Water Technologies's service team and the reliability and operation of the water treatment system.

The treated water has consistently been fully compliant with the regulatory standards, with total viable bacteria count <10 cfu/100ml and endotoxins <0.25EU/ml. The London Clinic's previous water system was chemically sanitised and, by introducing heat sanitisation, operating costs have been reduced by £4,000 per annum on cleaning chemicals and the man hours required to sanitise the system. Heat sanitisation is more environmentally friendly than chemical sanitisation and is carried out fully automatically outside working hours.

Benefits

- Fully compliant with regulatory standards
- No down time for sanitisation during the working day
- Reduced operating costs

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