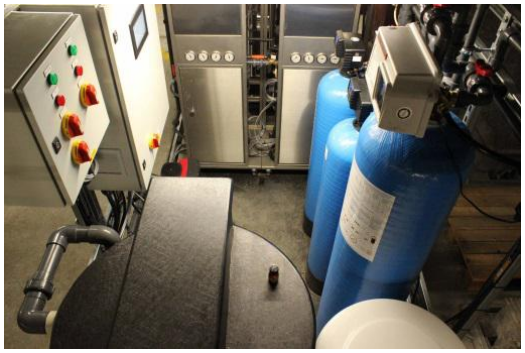
Southampton Water

The water quality demanded by the HTM standards is ever more demanding and Southampton General Hospital decided it was time to replace their aging water treatment systems. Bradley Unwin, Business Development Manager, tells us how.

University Hospital Southampton NHS Foundation Trust is a centre for teaching and research in association with the University of Southampton and partners including the Medical Research Council and Wellcome Trust. The Trust provides services to some 1.9 million people living in Southampton and south Hampshire, plus specialist services such as neurosciences, cardiac services and children's intensive care to more than 3.7 million people in central southern England and the Channel Islands.

Southampton General Hospital is the Trust's largest location, with a great number of specialist services based here, ranging from neurosciences and oncology to pathology and cardiology. As a centre of clinical and academic excellence, this is where new treatments are being discovered, new healthcare professionals are being trained and cutting edge developments are being put into practice. Emergency and critical care is provided in the hospital's special intensive care units, operating theatres, acute medicine unit and emergency department (A&E), as well as the dedicated eye casualty. Southampton General also hosts outpatient clinics, diagnostic and treatment work, surgery, research, education and training, as well as providing day beds and longer stay wards for hundreds of patients.

Two of the most critical areas for the hospital are the Endoscopy Unit and the Sterile Services Department both of which were served by water purification systems that were nearing the end of their lives.



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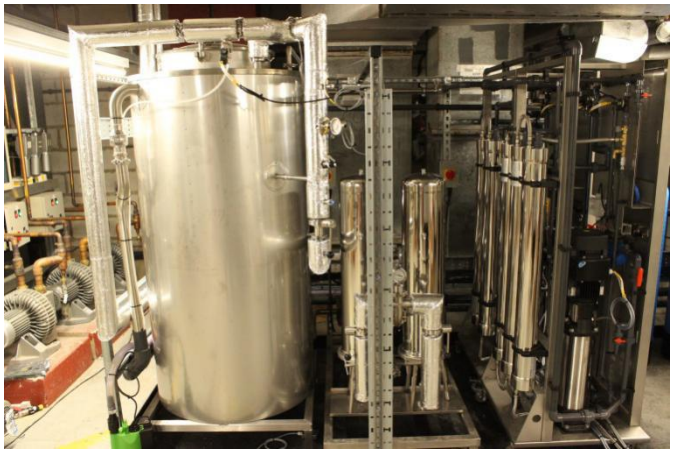
Endoscopy Unit

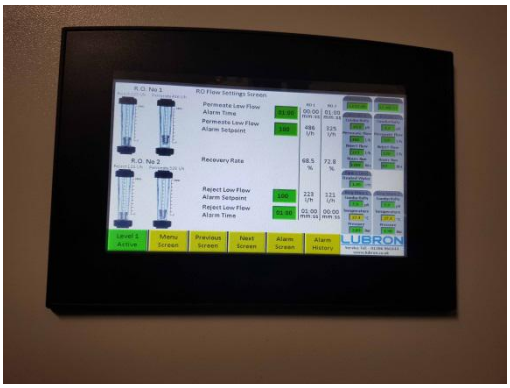
Many of the procedures carried out at Southampton General involve endoscopy, and the hospital's busy Endoscopy Unit has a number of Getinge ED-FLOW automated endoscope reprocessors. The systems require water for all of the wash stages which has to meet the requirements of HTM 01-06 (see table).

Water Quality Standards for Endoscope Reprocessing (HTM 01-06) and Washer Disinfectors (HTM 01-01)

		HTM 01-06	HTM 01-01
Appearance		Clear, colourless	Clear, colourless
pH		5.5 to 8.0	5.5 to 8.0
Conductivity at 25°C	µS/cm	<40	<30
Total dissolved solids	mg/100ml		<4
Total hardness	mg/l $CaCO_3$	<50	<50
Chloride	mg/l Cl		<10
Lead	mg/l Pb		<10
Iron	mg/l Fe		<2
Phosphate	mg/l P_2O_5		<0.2
Silicate	mg/l SiO_2		<0.2
Total Organic Carbon	mg/l	1	
Total Viable Count 22°C	cfu/100ml		<100
Total Viable Count 37°C	cfu/100ml		<100
Bacterial endotoxins	EU/ml		<0.25
Temperature	°C	Ambient	35
Sanitisation temperature	°C		85



The existing water treatment system was a chemically sanitised plant, and Southampton General's Decontamination Manager, Jean Hedges, was keen that the replacement should use heat sanitisation. Glen Campbell, the Trust's Project Manager responsible for the replacement plant takes up the story: "We talked with Lubron Water when we first began specifying the Reverse Osmosis (RO) plant for the Endoscopy Unit and wound up working right the way through to installation and delivery. Installation was quite tricky because there was limited space in the plant room so it was very much a bespoke engineered solution." Lubron Water's new 600 litres per hour plant consists of a backwashable activated carbon filter to remove residual chlorine from the mains water supply, followed by duplex water softeners to prevent scaling in the downstream duplex RO systems. These are Osmostar units, each of which is capable of producing the full flow of 600 l/h but can, if demand is at a peak, be operated together to produce up to 1200 l/h of compliant water. The Osmostar permeate is delivered into a 500 litre stainless steel storage tank from which it is pumped to points of use via two 25mm stainless steel distribution ring mains each equipped with a UV disinfection unit, a 0.03µm absolute filter to ensure bacterial compliance and sterile sample points. The tank is fitted with a heater to allow the temperature to be increased to 85°C for sanitisation of the tank and ring mains. The complete plant is controlled from a Central Control Panel incorporating Vision7700™ PLC with a built-in, password-protected HMI Operator Panel, comprising a 7" colour touch screen with live P&ID and alarm history that can also display historical data graphs to reflect trends.



Sterile Services Department

Southampton General is served by a central Sterile Services Department which provides sterilisation of surgical instruments, devices and dressings for use in the operating theatres. It has seven MMM Uniclean PLII washer disinfectors, each of which uses 40 litres of water per cycle at a peak flow of 1200 l/h. The water supplied to the washer disinfectors has to comply with the latest issue of HTM 01-01 which requires a new silica standard of 0.2mg/l (see table).

The new treatment plant uses essentially the same process technology as that of the Endoscopy Unit plant. However, in order to meet the new low silica standard, the duplex Osmostar units are operated in series or twin pass configuration. Each Osmostar is sized at 100% of the total design flow so that during servicing or in an emergency situation, one unit operating in single pass mode can provide the required flow of permeate. An electro polished heating coil is located in the treated water tank, this is electrically powered and can increase the temperature from ambient to 65°C for normal operation purposes, and to 85°C for sanitisation.

As Project Manager Gary White explains, installation presented Lubron Water with a few challenges: “Obviously we would have liked to install the new plant where the old one was but, to keep the washer-disinfectors operational we needed suitable quality water which meant that we had to keep the old plant running while the new one was installed and commissioned.” Finding a suitable location for the new plant and distribution loop was the main problem and this caused some programme delays but Gary’s team worked with Lubron Water to plan the changeover so that there was no loss of service. In fact completion of the project was only a couple of weeks late.

Commenting on the new water treatment plants, Jean Hedges said “It’s improved the water quality no end. Because the units are twin pass, the high silica is removed to safe levels and we have had no microbiological issues. And both projects came in on budget.”

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