

WCS Engineering supports leading defence manufacturer to reduce costs, save energy, increase reliability and reduce chemical handling

Problem

Site has an ongoing requirement for ultra-pure water coupled with a smaller demand for RO quality water. Ultra-pure water quality requirement was $> 10 \text{ M}\Omega$, with the RO water quality requirement being $10 - 20 \mu\text{S}$.

Previously the water requirement had been met by using an RO plant and then passing the permeate through a demineralisation plant.

Site had stored treated water capacity of approximately 100 m^3 over 4 tanks, 50 m^3 RO water and 50 m^3 demin water, with a water usage of approx. 20 m^3 per day. There was also a raw water break tank sized at 25 m^3 .

Site also had an old distribution system around the factory consisting of an old triple pump set circulating through a 2" ring main.

Solution

WCS Engineering team designed a replacement system to cover the whole treatment and distribution system.

Based on the water usage on site the following was installed

- New raw water break tank, sized at 6 m^3 , divided to enable easy cleaning
- Twin Electronic Deionisation (EDI) plants with associated pre-treatment, run on a duty/standby/assist basis
- One new 23 m^3 Demin water storage tank
- 1 new 10 m^3 RO water tank
- 1 new demin water circulation loop, with new circulation pump set
- 1 new RO water circulation loop, with new circulation pump set
- Blend system to convert demin water to RO water
- Polishing vessels on demin water circulation loop to ensure water quality to service
- Uv units on loops to ensure water quality.



By installing the new treatment process site were able to stop the use of both HCl and Caustic in the treatment process as the need for chemicals was removed.

The amount of water to drain was reduced significantly by the use of newer equipment.

Reducing the volume of stored treated water and the installation of the new ring mains with no dead legs has improved the bacteriological control on the whole system.

Improvements to the water quality in the ring main has reduced the need for further treatment at various locations across the facility.

The installation of new booster pumps as drastically reduced the energy usage by the circulation pumps.

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