

Oman FO plant sees high savings

The company was granted the Al Naghdah project based on its experience in Al Khaluf where it demonstrated savings at the FO operation

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Modern Water expects to achieve greater than 30 per cent energy savings at a forward osmosis (FO) desalination plant it is building in Oman and which is billed as the world's first fully commercial facility of its kind.

Peter Nicoll, Modern Water's technical director, said a figure that high in energy savings was expected at the plant being built in Al Naghdah in Oman's Wosta Region based on what was achieved at a trial plant the company built and operated in Al Khaluf, also in Oman.

"Our experience at Al Khaluf is that an existing plant was cleaned every two to four weeks whereas our (trial) plant has never been cleaned in the two years we have been operating," said Nicoll.

"The only treatment that has taken place has been occasional osmotic backwashes. As a result of this low fouling, plant availability is higher. Also, as we're not using chemical cleaning there are greatly reduced environmental discharges.

"It is also an inherent feature of our process that the boron levels of the product water are lower than in the reverse osmosis process and therefore in certain circumstances does not require any post-treatment. This has a direct effect on reducing capital expenditure and operating expense."

Modern Water is building the FO desalination plant for Oman's Public Authority for Electricity and Water. It will produce 200 cu m of fresh water per day.

Interest stirred

Nicoll said Modern Water's core platform forward osmosis technology had generated a good deal of interest, particularly in the Middle East where "conditions are such that the performance of our technology is greatly enhanced."

Forward osmosis or "manipulated osmosis" or just "osmosis" are terms used to describe a natural phenomenon, whereby a solvent flows from a



A Modern Water technician in Oman

region of lower osmotic pressure across a selectively permeable membrane to an area of higher osmotic pressure. A good example of this in nature is the mechanism, whereby plants take up moisture in their root systems and become turgid. Two fluids with differing osmotic pressures can be manipulated to exploit this natural phenomenon, so that, for instance, essentially pure water can be made to flow out of seawater across a selectively permeable membrane to dilute a solution with a higher osmotic pressure.

Nicoll highlighted that the FO process could be applied to a number of different industries including ones engaged in the supply of water specifically for evaporative cooling make-up water.

Game-changing economics

The company has an evaporative cooling proving plant in Oman that has been operating for more than a year. "The economics have proven to be game changing with the water produced at a fraction of the operating expense of conventional desalination processes. In this particular case the power consumption is less than 50 per cent of conventional processes and has all the inherent advantages of low fouling attributable to the forward osmosis process," said Nicoll.

Modern Water has developed a new technology for the preparation of make-up water from impaired water sources, ranging from seawater to treated sewage effluent. The process uses manipulated osmosis to produce permeate quality make-up water. The technique allows the economic use of water sources, which otherwise, would not be considered for make-up and, therefore, extends the applicability of evaporative cooling.

Nicoll said Modern Water was pursuing several other



The company's performance at Al Khaluf helped it win a commercial contract

areas where the economics of concentrating solutions without phase-change looked particularly attractive.

Monitoring division

Alongside its platform FO process for desalination, evaporative cooling and further applications, Modern Water has a dedicated monitoring division which was launched earlier this year to consolidate its activities in the instrumentation and monitoring industry.

"The division currently comprises our market-leading water toxicity monitor and world-leading heavy metal analysers. We are experiencing accelerated revenues within the division, particularly in China" said Nicoll.

"The Cymtox Continuous Toxicity Monitor is the only real-time broadband continuous toxicity monitor currently available. The technology works by using bioluminescence to detect the presence of toxins and immediately warn of suspicious changes. The Cogent online and onsite portable products OVA



Equipment at the Al Khaluf plant where Modern Water demonstrated its technology

and PDV are the world's best proven trace metal analysers and are used for monitoring heavy metals in over 20 countries."