Krosys saves energy and maintenance costs while processing unique “lava water”

Highlights

Energy-efficient 500 CMD plant

Low-maintenance reliability

Zero risk of oil contamination

Submerged deep beneath the sea below Jeju Island, at the southernmost tip of the Korean peninsula, lies an amazing treasure: a gigantic pocket of “lava water”. An estimated 300,000 years in the making, the 2.7 billion tons of ancient seawater has been naturally filtered and trapped between layers of volcanic basalt – and is exceptionally pure.

Local officials keen to boost the island’s economy– and diversification from dependency on tourism and agriculture – were quick to recognize the industrial potential of their aquatic cache and put a new desalination plant out to tender. Krosys, a leading Korean firm with long experience in SWRO and wastewater systems, won the tender with a plant based on Danfoss high-pressure pumps and ERDs.

The two-train, 500 CMD plant – designed around two APP 26 high pressure pumps and two iSave 21 ERDs – ensures long service intervals and built-in redundancy.

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W.H. Kang,
Research Fellow Operating Officer of Jeju Technopark's Lava Seawater Industrial Complex.

Challenge

Transform a pristine source of seawater into value-added potable and special-use water efficiently, reliably and with absolute purity

The owner/operator of the new SWRO plant created to extract and process the island's buried treasure, Jeju Technopark's Lava Seawater Industrial Complex, had a range of demands for the system builders at Krosys.

The SWRO plant had to be energy efficient, as electricity bills are the single highest cost driver over the life time of a plant. Since they were new to SWRO – and Cheju Island is 300 km from the major port city of Busan – they also required that the system be as low-maintenance and reliable as possible. Finally, given the lava water's unspoiled heritage and the importance of its purity for value-added uses (e.g., bottled water, cosmetics and pharmaceuticals), it was imperative that the SWRO plant be as clean as possible.

Solution

Reliable, low-maintenance Danfoss APP pumps and iSave ERDs

Krosys was familiar with Danfoss's APP technology from a number of other applications, and had no doubt that the axial piston pumps would be the ideal choice for Jeju Technopark's Lava Seawater Industrial Complex. The project's first phase, a 500 CMD plant, thus built on two APP 13 pumps and two iSave 21 ERDs.

"Based on previous experience with the Danfoss APP pumps, we were convinced that APP pumps and iSave ERDs would be the most energy efficient solution for the Jeju plant," says H.W. Jang, system builder at Krosys. "Our client had many demands, but first and foremost among these was reliability. With fewer parts, outstanding build quality and simpler maintenance routines than centrifugal pumps, there's just not as much that can go wrong with APP pumps. And in case we do need help, Danfoss's record of quick local service has always been a huge help. That the APPs need no other lubricant than the pumped medium is a plus, too, when purity is so much in focus."

The two energy-efficient APP 26, each with a nominal flow rate of 26 m³/hour/114.5 GPM, produce 500 m³ of purified "lava water" per day.

Results

Satisfied end users – a rejuvenated local economy – and expanded capacity

Since the first 500 CMD plant went on line in 2014, Jeju Technopark's Lava Seawater Industrial Complex has gone from success to success.

Its bottled water has become a strong brand in Korea and is now exported, too. Both the processed water and the pure minerals captured in the RO process bring added value to a number of cosmetic and pharmaceutical products. The local agricultural sector is thriving. And growing consumer and industrial demand has led to plans to double plant capacity to 1,000 CMD by adding new trains built around two APP 26 pumps and two iSave 21 ERDs.

"We're extremely satisfied with the high energy efficiency, reliability and low maintenance of the Danfoss high-pressure pumps and ERDs," explains W.H. Kang, Research Fellow Operating Officer of Jeju Technopark's Lava Seawater Industrial Complex. "That is why we had no hesitation when Krosys recommended these components to be the heart of the winning bid for our expanded SWRO plant."

KROSYS

About Krosys: Based in Busan, Krosys is a leading South Korean provider of RO desalination systems and shipbuilding equipment.

Krosys designs, manufactures and sells water treatment systems for a wide variety of land-based and marine applications.

For more information, see http://www.krosys.com

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