

Case story | INEXA

INEXA designs **energy-efficient SWRO plant** around six **Danfoss APP pumps running in parallel**

HIGH

reliability of water supply ensured by 6 APP pumps in parallel.

hpp.danfoss.com

Through its innovative system of energy audits and efficiency improvement planning throughout Spain, INEXA has acquired deep expertise in retrofitting and designing energy-efficient SWRO plants. In addition to providing insight into what drives energy consumption and costs, the audits also led INEXA's engineers to spend hundreds of hours with plant managers and owners, and thus learn extensively about the practical challenges they face every day.

INEXA has transformed this insight into designing and constructing some of world's most energy-efficient SWRO plants. Their most recent project incorporated no fewer than six Danfoss APP pumps, running in parallel, at a new plant in Bahrain.

The challenge: Design an SWRO plant that is energy-efficient, reliable and flexible

INEXA won the contract to design, build and maintain a 3500 m³/day SWRO plant for Bahrain's Arab Shipbuilding & Repair Yard (Asry), one of the Middle East's largest marine maintenance installations with over 5000 employees. The client, Gulf House Markets, is an experienced SWRO company that had exacting demands for the project.

"Our client understands full well that energy is the key cost driver for SWRO," explains Fernando Suarez, INEXA's CEO. "Since its contract with Asry locks in water prices for the 25 years of the build-own-transfer period, energy efficiency was an absolute priority. But the ability to respond to capacity fluctuations in a flexible way – and simple maintenance – were other key considerations.

The solution: 6 Danfoss APP pumps running in parallel

INEXA designed the 3500 m³/day plant around six Danfoss APP 30 pumps – the most efficient high-pressure pumps in their class.

"Of course, the upfront costs of six axial piston pumps compared to one centrifugal pump are a significant investment," says Suarez. "But when you factor energy into the total costs of ownership, the decision is not a difficult one. The payback time is predictable, and improved profit margins for the client over the life of the project are substantial."

“But flexibility was another key reason we opted for the Danfoss APP solution,” Suarez adds. “The parallel construction concept makes it relatively simple to increase capacity incrementally, and during the design phase we did in fact increase the number of pumps from five to six, thus boosting plant capacity from 3000 to 3500 m³/day. We can easily vary production by changing only pump speed, so adjusting the plant’s total capacity to actual demand is easy and efficient. Parallel pumps ensure reliable supply even if one of the pumps is down for maintenance, and Danfoss APP pumps have an additional advantage here: with fewer moving parts than centrifugal pumps, they are very simple to maintain and they run for thousands of hours between service intervals.”

The results: One of the most energy-efficient SWRO plants in the Middle East – at just the right time

Asry’s new plant went on line in February, 2016 – the same month crude oil prices dropped to some of the lowest prices in over 10 years. But paradoxically, lower crude prices are making water producers in the Middle East more interested in energy-efficient production, not less so.

“Energy efficiency used to be far less relevant to SWRO in the Middle East, but that situation is changing fast,” says Suarez. “Now, governments that have historically relied on high oil prices to finance generous subsidies on electricity and water are cutting these subsidies. The result is higher electricity and water prices – in some cases sharply higher.”

“In Bahrain, state-supplied water jumped from 0.35 to 0.75 dinars per m³ from February to March of this year. That’s a dramatic increase that would have hit a company like Asry hard. We believe the Middle East is entering a new era in which energy efficiency will play an increasingly important role in SWRO, and that Danfoss and INEXA can help operators and owners cut costs.”



APP 30

About INEXA

INEXA is a specialist in energy-efficient desalination, drinking water treatment, water distribution and waste water treatment. Based in Las Palmas de Gran Canaria, Spain, the company pioneered an innovative system of energy audits designed specifically for water treatment and desalination applications, and has since leveraged its energy expertise in engineering and plant construction projects around the world. See more at www.inexa.es.

Danfoss A/S High Pressure Pumps . Nordborgvej 81 . DK-6430 Nordborg, Denmark

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without consequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.