



REVERSE OSMOSIS - DESALINATION

Lanzarote Volcanic Island Tourist Complex

File No. 02, Section 8



OPERATION:

In the world of RO-desalination, the Canary Islands are known as the largest RO-laboratory on earth. It is believed that any RO-equipment that can cope with chemically treacherous Canary waters, can be operated anywhere in the world. In RO-desalination, the high-pressure pump is an essential component and must be designed to handle these treacherous conditions.

In 1985, Borje Johanssen, a Swedish Engineer, built an 800 m³/d SW/RO-plant for a tourist complex on the volcanic island of Lanzarote. It consisted of four trains of 6-inch spiral wound membranes, each one fed by two positive displacement pumps. Johanssen opted for CAT PUMPS as his company had over 10 years of experience with these difficult waters and the CAT PUMPS were widely used over the Archipelago.

With a conversion rate of 33% and an operating pressure of 64 bar (940 PSI), the power consumption of the modules in 1985 was over 6.7 kW-h/m³, well pump included.

PROBLEM:

Expand the capacity of a ten-year-old CAT PUMP RO System.

SOLUTION:

Install a new 150FR CAT PUMP large capacity system.

SPECIFICATIONS:

CAT PUMPS Model	SSD 152R080
Pressure.....	800-1000 PSI
Flow	125 GPM
Temperature	Ambient
Fluid.....	38,000 TDS Seawater
Duty Cycle	Continuous
Drive.....	100 H.P. Electric

BENEFITS:

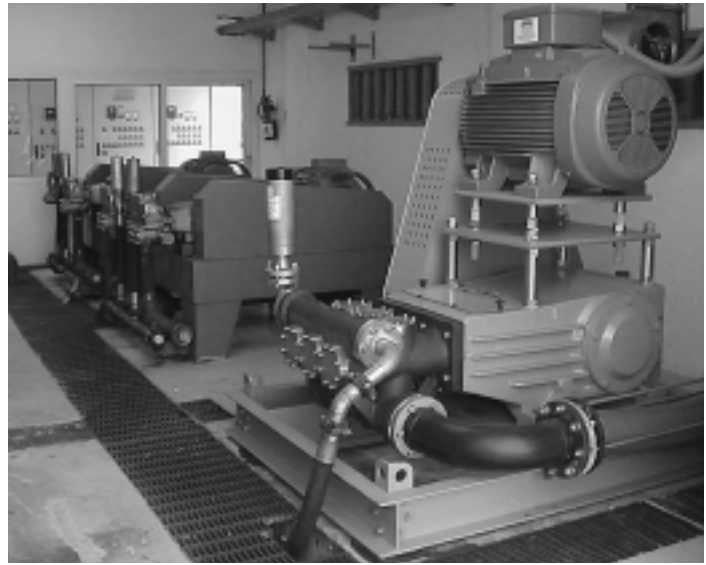
- System capacity doubled with a single pump installation.
- Low amp draw offering a 62% energy savings.
- 35% conversion rate to fresh water.
- Durable Duplex Stainless Liquid-end.

“Customer confidence is our greatest asset”

Seven years later, in 1992, each of the eight NAB CAT PUMP Model 6767 pumps showed over 50,000 hours and it was decided the plant would be retrofitted by the DPG-Company. At this time eight new 316 Stainless Steel CAT PUMPS Model 6761 pumps were installed and 8-inch membranes replaced the previous 6-inch membranes. Without any difficulty, turbo-chargers were synchronized with the CAT PUMP units, increasing each module capacity up to 250 m3/d and reducing energy consumption down to less than 5.0 kW-h/m3 permeate. In 1992, this was an excellent result.

Ten years later, in 2002, all eight 316 Stainless Steel CAT PUMPS show over 70,000 hours of continuous running and still in good operating condition. The plant owner entrusted the DPG-company once more to retrofit and to expand the plant's capacity. As a starter, DPG decided to replace one 250 m3/d CAT PUMP module with a single unit containing the new Duplex Stainless Steel CAT PUMP Model 152R080. This is coupled to a Pressure Exchanger-energy recovery system.

The results are overwhelming. Production went up to 510 m3/d per module at a new 35% conversion rate and because the pump hardly draws 78 amps, energy saving is over 62% compared to the previous system. Energy consumption now is merely 2.64 kW-h/m3, beach well pumps included. Moreover, product quality has improved to less than 250 ppm. In addition, pump maintenance is even less with the single pump.



CAT PUMPS Power Units [Background 60 FRAME, Front 150 FRAME]

Although, the remaining three 316 Stainless Steel CAT PUMP Model 6761 units are still operational, the end-user has been so impressed by the new 150 Frame results that another two CAT PUMP Model 152R080 units are already in-place and ready to take over from the 10-year old Model 6761 pumps. These older units will be used as stand-by units or in case of supplementary water demand.

Altogether, the CAT PUMPS have successfully produced potable water from the 38,000 TDS seawater during more than 1,000,000 hours of operation.

The Pumps with Nine Lives.

Products described hereon are covered by one or more of the following U.S. patents 3558244, 3652188, 3809508, 3920356, 3930756 and 5035580

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