ENGINEERING TOMORROW

Case story | Reverse Osmosis of South Florida

Danfoss APP pump **runs 27,000 hours** in remote island location

One of the 700 islands that comprise the Bahamas, Elbow Cay is located far from the beaten track in the Abacos, a section of the northeastern Out Islands.

A paradise for boaters and vacationers, the remoteness of the location presents special challenges for SWRO plants. In a place where the repairman has to fly or sail in, low maintenance and long life are key requirements for critical components – and an ideal testing ground for the reliability of APP pumps.

The challenge:

The remoteness of the Abacos Islands places special demands on a high-pressure pump's longevity and maintenance requirements

Island hoppers looking to get away from it all need look no further than Elbow Cay in the Bahamian Out Islands. Located 100 miles north of Nassau and 200 miles east of West Palm Beach in Florida, the tiny island is charmingly free from giant resorts and cruise ship tourists. It is also far from any major utility or major urban center.

"Once you get away from the main islands of Nassau and Grand Bahama," explains James Graham, president of Reverse Osmosis of South Florida, "infrastructure is much less developed. If you want fresh water you generally have to make it yourself. And because of high electricity and logistics costs, it pays to think in terms of both energy efficiency and low maintenance. Flying in personnel to do regular repairs or troubleshooting is just too expensive."

The solution:

An APP pump guaranteed to run 8,000 hours before its first service check

Reverse Osmosis of South Florida has installed Danfoss high-pressure APP pumps in locations throughout the Caribbean, and was thus quite familiar with Danfoss's 8,000-hour guarantee.

"We don't want to be flying in and out any more than necessary, so we felt confident in selecting an APP 1.8 for a residential project in Elbow Cay," says Graham. "We knew the customer, and we knew he understood the importance of good filtration. The APP 1.8 was the right size to handle the 1,500 gallons per day he needed. It's an energy-efficient pump, which is critical on a remote island that relies on diesel generation for most of its electricity. And with an 8,000-hour guarantee before the first service check, we felt confident that the maintenance costs would be predictably low."

The results:

27,000 hours and still running – after the first service overhaul at 23,000 hours - and significant energy savings

"As it turns out, the APP 1.8 ran almost three times its guaranteed hours before the first service check," smiles Graham. "It was performing up to specs, so we let well enough alone and kept it running for 23,000 hours, when we decided we'd better open it up and have a look."

"Of course, our service technicians did discover some signs of wear, but these were minimal considering the number of running hours," says Graham. "This says a lot about the pump's build and reliability. It also demonstrates the importance of filtration. The customer was meticulous about following filtration specifications, and this clearly pays off."

While they had the pump open, technicians replaced O-rings, shaft seal, valve port plate and pistons. The rebuild did not include any work on the swash plate, barrels or cap seal plate.

Now, the pump has returned to Elbow Cay and has since run an additional 4,000 hours.

"As long as the customer continues to be careful about pre-filtration, and uses a good-five-micron filter, the APP 1.8 should have many more hours to go before it needs to be replaced," concludes Graham.

Danfoss APP 1.8 axial piston pump running for 23,000 hours before its first overhaul.

Some of the advantages by using axial piston pumps:

Axial piston pumps require considerably less service than plunger pumps. Not only do they run far longer before major service overhauls - they do not require any of the daily, weekly and monthly service routines needed by plunger pumps.

Since axial piston pumps use more pistons than plunger pumps, pulsation is considerably reduced. This means an axial piston system does not need pulsation dampeners, which wear out and must be replaced in plunger pump systems.

Unlike plunger pumps, axial piston pumps used the pumped medium, salt water, as the pump's lubricant. Replacing oil lubricants with salt water eliminates the risk of oil contamination; it also eleminates troublesome maintenance tasks such as daily checks for oil leaks and oil changes after 500 hours.

Reverse Osmosis of South Florida, established in 1983, provides fresh water solutions to a wide variety of customers in the US, South and Central America and the Caribbean islands. According to James Graham, president (shown above), the firm is active across a number of segments, including yachting, residential, hospitality and manufacturing.

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