

## Case story | Water Works

# Water Works, Inc. retrofits **Hawaiian RO plant with Danfoss pumps** and reduces energy costs and CO<sub>2</sub> emissions



**38%**  
energy savings

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*Located on the stunning west coast of Hawaii Island, an upscale golf course community was eager to reduce power consumption for its RO plant – both to lower CO<sub>2</sub> emissions and to save on the high energy costs typical of island communities.*

*When the community asked Water Works, Inc. to find a way to do both, the San Diego-based experts in water purification chose Danfoss APP technology to replace an aging centrifugal pump and deliver quick return on investment.*

### **The challenge: High electricity costs and inefficient pump make an unsustainable cocktail**

Like many other island communities, electricity prices on Hawaii Island are high. Although renewables are on the rise, local utilities still rely heavily on imported oil to power generators. Fuel represents about half of the typical electricity bill – a significant cost for RO water producers.

Community managers were interested in the most energy-efficient solution available both to reduce its energy bills and its carbon footprint. Located on the exclusive Kona-Kohala Coast, the community celebrates traditional Hawaiian values and design, and its owners are dedicated to the preservation of the area's

unique environment. By reducing the power consumption of its golf course's irrigation system, community managers could save unnecessary expenses and at the same time reduce the community's carbon emissions.

Could Water Works find a way to reduce the community's power consumption – and deliver not only financial and CO<sub>2</sub> savings but a solid business case for a retrofit, too?

### **The solution: Replace existing centrifugal pump with Danfoss APP technology**

The community previously relied on multi-stage centrifugal pumps deployed across four parallel arrays, all with energy recovery devices (ERDs), to filter brackish water from underground wells. Water Works' lead engineer for the project, Mark Maki, was familiar with Danfoss APP pumps and suggested retrofitting one of the four centrifugal pumps to prove the retrofit concept – and deliver rapid energy and CO<sub>2</sub> savings.

"Depending on the season, the four-array plant usually runs at 50 – 75% of capacity," explains Maki. "With a total capacity of 900 gallons per minute distributed across four arrays, there was little risk for the customer to retrofit one of them with APP technology and much to gain. We decided to install two

APP 26 pumps – at 25 HP each for a total of 50 HP – on one of the arrays to replace one of the older centrifugal 75 HP pumps.”

“For some companies, such a retrofit might be demanding. The existing arrays were built around centrifugal pumps with different inlet and outlet connections, so we did have to change some piping and electrical. But Water Works thrives on such projects. We don’t do “catalogue” water treatment plants, and we have a lot of smart people who think outside the box to find the best solution for every project.”

### **The results: 38% drop in energy usage – and fast payback**

The retrofit went on line at the end of May 2017 and has been running practically non-stop since “The APP-driven array has become the workhorse of the entire plant,” says Maki.

“With energy savings of 38%, the community is running it nearly 24/7 to reduce usage of the three centrifugal arrays and maximize cost and CO<sub>2</sub> savings. And the APPs are happy to cooperate. Danfoss assured us they could run continuously, and that’s what they’ve done. These are low-maintenance pumps with long service intervals, with reliability we and our customers can bank on.”

Total cost of ownership is a key parameter for Water Works, whose managers calculate a payback time of just 18 months for the first retrofit. “The return on investment for this retrofit is convincingly fast,” says Maki. “Since two arrays are typically operating 24/7, the payback for retrofitting a second array will also be about 18 months. This second retrofit is planned for the near future.”



Two APP 26 pumps from Danfoss replacing one centrifugal pump



APP 26 pump

### **About Water Works, Inc :**

Water Works, Inc., located in San Diego, CA, designs, engineers and installs municipal and industrial RO plants and ultrapure industrial water systems for the life science businesses.

For all installations, Water Works conducts thorough economic analyses that balance the customer’s operational and growth requirements against capital, operating, validation and maintenance costs. In order to offer customers sustainable cost advantages without compromising quality, Water Works continues to invest in the latest manufacturing technologies and top engineering talent.

For more information, visit <http://www.ultrapurewaterworks.com/>

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