

ENERGY SAVING RETROFIT FOR ENHANCED PLANT CAPACITY

at Red Sea Resort



LOCATION

Hurghada, Egypt

CUSTOMER

Interwater

EST. COST SAVINGS

\$78,584 USD annually

TOTAL CAPACITY

1,200 m³/day

EST. ENERGY SAVINGS

1,576,800 kWh annually

CO₂ SAVINGS

~750 metric tons annually

Hurghada is one of the largest resort towns off the coast of the Red Sea in Egypt. Due to increased tourism demand, it has seen growing development with a surge of resorts and hotels. The town relies on desalination to supply drinking water and combat the lack of fresh water supply. Because of the high costs of providing potable water and energy, reducing

energy consumption is critical. Safa Water Technology partnered with Interwater to retrofit two desalination plants by the Red Sea in order to lower their high energy consumption. Interwater elected to switch out the previous Pelton wheel energy recovery device (ERD) for Energy Recovery's ERD, the PX 260, to increase plant capacity and efficiency.

THE CHALLENGE

Increasing Water Capacity for Tourism

Safa Water Technology provides water for consumption by hotels and resorts near the Red Sea with two reverse osmosis (RO) plants. Before the retrofit, each plant had a production capacity of 500 m³/day and a high specific energy consumption of 6.3 kWh/m³. The plants had existing ERDs with reliability issues, including turbine failures. To increase production capacity while lowering the energy requirements and costs, the company collaborated with Interwater, which helps install and operate desalination plants, to implement a retrofit.



THE SOLUTION

The engineers at Interwater chose to employ Energy Recovery's PX[®] Pressure Exchanger[®] devices. This was the critical factor in reducing energy consumption, as the PX can recycle high-pressure energy from the reject brine and circulate it back into the system with a peak efficiency of 98%.* One of the main factors in their decision is the high reliability and uptime of the PX, which is manufactured using corrosion-resistant ceramic. Designed with only one moving part, the PX provides maximum efficiency and consumes no electrical power, allowing the plant to reduce its energy consumption by as much as 60%.*

After evaluating the existing plants, the Energy Recovery service team successfully commissioned the PX 260 during the plants' complete refurbishment, encountering no technical difficulties with the implementation and eliminating the turbine failures associated with the previous Pelton wheel ERD.



“ We are very satisfied with the performance of Energy Recovery’s PX[®] Pressure Exchanger[®]. By integrating the PX into our desalination process, we were able to successfully reduce our energy consumption by a significant margin, while maintaining plant availability and requiring no scheduled maintenance. Through using Energy Recovery’s PX in the reverse osmosis process, we were able to reduce our power consumption from 6 kWh/m³ to 2.7 kWh/m³ in two reverse osmosis units, each with a capacity of 600 m³/day. ”

– Samuel Maher, Engineer Manager at Interwater

THE RESULT

Focusing on enhancing energy efficiency, the plants successfully reduced the specific energy consumption by 55%, allowing them to increase water production while saving money. After implementing Energy Recovery's ERDs, the two plants increased their total capacity to 600 m³/day each and lowered the specific power consumption down to 2.7 kWh/m³. Through partnering with Interwater, the plants

reached an optimal design using Energy Recovery's PX 260 as a new ERD. The facilities have successfully operated since 2019, producing water for multiple hotels in Hurgada. By incorporating the PX 260, the plants are able to save 4,320 kWh/day and an estimated \$78,584 annually.

*Actual results may vary.

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