Energy Recovery News April 19, 2004

ERI PX gives Florida Municipal Brackish RO Plant 37% Energy Savings

Device thoroughly proven in hundreds of seawater applications has now been shown to save big dollars in brackish RO applications. In the seawater desalination industry, it is common knowledge that the PX is a reliable energy recovery device that dramatically lowers operating costs. But can the PX achieve these kinds of results in brackish water applications? In February-04 this question was answered at the Card Sound Golf Club desalination facility at the Ocean Reef Club in Key Largo, Florida.

Duane Goheen of Mesco Inc. first brought the project to ERI's attention in mid 2001. It has been reported that the golf resort pays as much as $6 per 1000 gallons from the local water authority making on-site desalination an attractive cost saving option. Because of its high efficiency the ERI PX promised a capacity expansion with the lowest possible capital and O&M costs compared to other energy recovery technologies. Many issues had to be overcome however, including the installation of new feed water wells. Then there was the question of whether the PX could produce adequate results in this low-pressure system, but Mesco, Inc. and Card Sound were willing to see the project through.

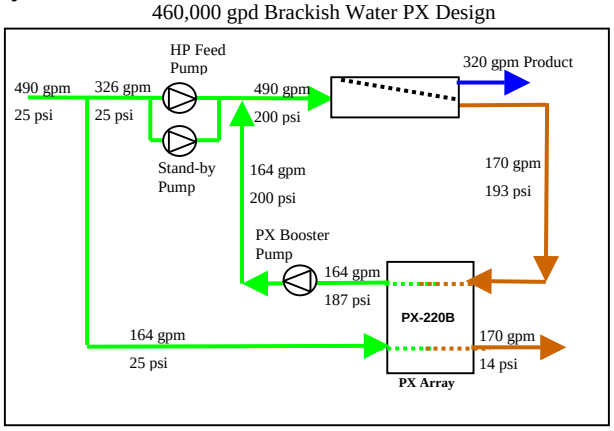
Although the PX has proven itself in hundreds of seawater and several brackish water applications worldwide, it had not yet been applied into a brackish water plant in the United States.

Right to left: PX-220B, RO Rack, Booster Pump and HP Pumps

There was concern that the PX might not be a viable and reliable solution for the brackish market because of the relatively low operating pressures, but when the PX-220B was put on line, the 37% power savings and quiet whir of the rotor put these concerns to rest. The plant saves 25 kW at $0.09/kWh resulting in a savings of nearly $15,000 per year. Running with the PX, electricity costs are now around $0.20 per 1000 gallons at the facility.

The total project included expanding the original plant by adding new membranes (12x6M Filmtec BW30-440 in total), replacing the old pumps with 2 new Afton main HP pumps (model # 4x6-9 MPV), installing an Afton PX booster pump (model # 2x3-7 ILVS) and installing the PX-220B. The design included a high degree of redundancy with two main HP pumps. The HP pumps can supply the total feed flow to the RO membranes or one pump can be taken off line and replaced with the PX system.

460,000 gpd Brackish Water PX Design



The design offered an excellent platform to compare a standard brackish RO system with no energy recovery to a system with a PX (see table).

Comparative Power Table

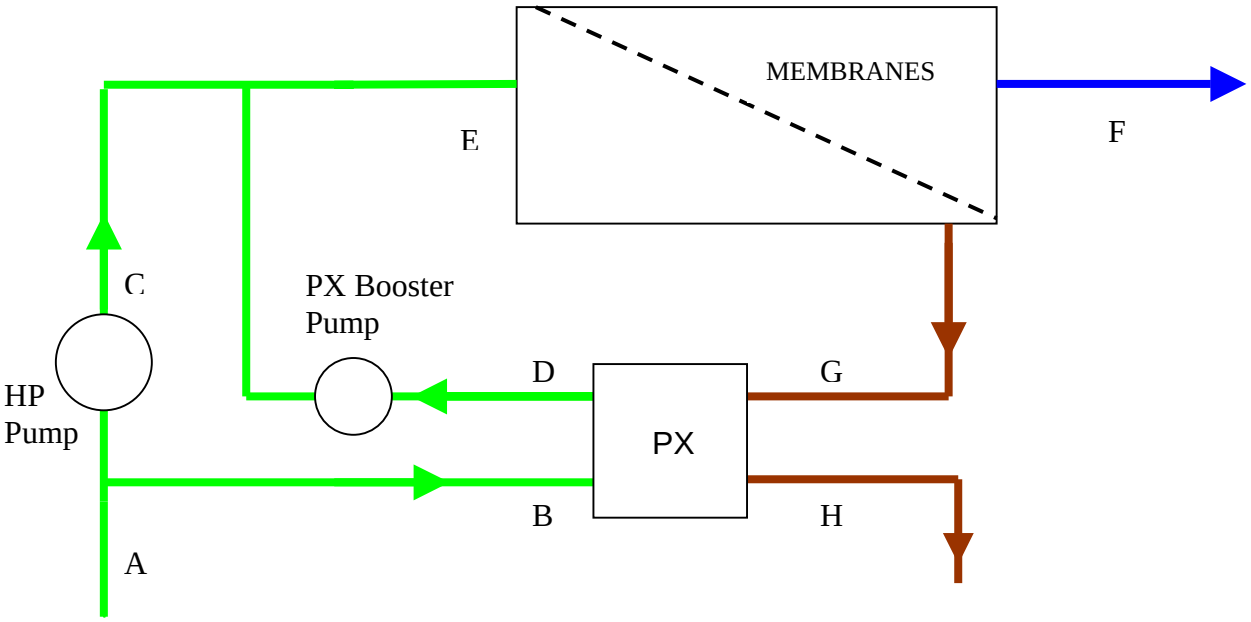
	Feed Psi	Total KW	Permeate gpm	KWh/1000 gal
Original System	300	60.8	200	5.06
2 new HP pumps	200	63.3	340	3.10
1 HP pump and PX	200	37.8	320	1.96

Ian Cameron, US Sales Manager for Energy Recovery is very excited about the project. "It proves that the PX is a very suitable energy recovery product for brackish water RO plants…. and with 20-30% savings in typical applications the return on investment is usually under 2 years."

Making Desalination Affordable

For more information on the project please contact ERI at sales@energy-recovery.com or telephone 510-483-7370.

Ocean Reef Club, Key Largo, Florida
460,000 gpd Brackish Water RO With Pressure Exchanger
200 psi feed pressure-65% Recovery



		A	B	C	D	E	F	G	H
FLOW	GPM	495.4	171.4	324.0	171.4	495.4	320.0	175.4	175.4
	m^3/hr	112.5	38.9	73.6	38.9	112.5	72.7	39.8	39.8
	m^3/day	2700	934	1766	934	2700	1744	956	956
PRESSURE	PSI	28	28	200	184	200	0	190	17
	bar	1.9	1.9	13.8	12.7	13.8	0.0	13.1	1.2
QUALITY	TDS	6525	6525	6525	6668	6575	478	16400	16000

PX-220B	QTY	**1**
PX UNIT FLOW	GPM	175

PX Internal Bypass	GPM	4
PX Differential HP side	PSI	6
PX Differential LP side	PSI	11
PX efficiency	%	91%
Membrane Differential	PSI	10
Recovery	%	65%

Total RO Process (kW)		**37.6**
kWh/m3 Permeate		**0.52**
kWh/1000 gal Permeate		**1.96**
Power savings/yr @ $0.09/kWh	**$**	**14,806**

HIGH PRESS. PUMP

Feed Pump efficiency	0.74	
Motor efficiency	0.92	
Power	kW	35.6

BOOSTER PUMP

Boost Pump Efficiency	0.65	
Motor Efficiency	0.92	
Power	kW	2.0