



WHEN IS 80% EFFICIENCY BETTER THAN 95%? UNCLAIMED \$10,000 TELLS STORY.

The November/December 2005 issue of D&WR featured an article on desalination costs by Mr. GG Pique, President and CEO of ERI, presenting facts on the rapid market acceptance of high-efficiency isobaric energy recovery devices (ERDs) for SWRO applications. The February/March 2006 issue of D&WR contains a “rebuttal” that claims a low-efficiency turbocharger can save more energy than the high-efficiency ERI PX Pressure Exchanger device. But since no side-by-side comparisons were made to substantiate these claims, we did the calculations and posted them in our website.

The results were not surprising: SWRO plants operating with PX technology consume far less energy per unit of permeate than similar plants operating with turbochargers. For example, the February D&WR article states that a plant in UAE is operating at 3.1 kWh/m³ with PX technology. With a turbocharger, energy consumption would be approximately 4.4 kWh/m³ – 42% more than with PX technology – despite higher efficiency pump and no mixing in the turbocharger case. Similarly, a plant in China operating at 3.0 kWh/m³ with PX technology would consume about 3.9 kWh/m³ with a turbocharger. Detailed and transparent calculations are available on ERI’s website: <http://www.energy-recovery.com>.

Plant operators that have replaced their turbochargers with PX devices have quickly paid for the changeout with energy savings. Club Lanzarote and Bonny plants in the Canary Islands reduced consumption from 5.0 to 2.6 kWh/m³ and by 48%, respectively, by retrofitting turbochargers with PX technology, while a plant in Mazarron, Spain reduced consumption by 0.6 kWh/m³ from its best performance with a turbocharger. Also, when two installations in Curacao experienced a reduction in turbocharger efficiency to less than 10% after fresh water incursion changed recovery rate, retrofit with PX technology cut energy consumption by over 40%.

Smart SWRO designers are “doing the numbers” and contacting PX device operators to verify efficiency and reliability performance. The most advanced turbochargers and Pelton wheels cannot recover more than 80% of the energy contained in the SWRO brine, which limits their application to increasingly elusive locations where energy is inexpensive. ERI PX devices deliver guaranteed transfer efficiencies in the 95 to 97% range, and because they maintain their high efficiency within a broad flow and pressure range, ERI clients get the energy savings they paid for - *every time*.

Most importantly, the PX device is reliable, requiring no regular maintenance or downtime despite the unfounded claims of the turbocharger vendors. That’s why isobaric ERDs led by the ERI PX device have captured over 50% of the SWRO market. PX device capacity sold since 1998 exceeds 1.3 million m³/day, currently saving clients 90 megawatts (MW) of energy. Large PX trains under construction right now in Australia, Algeria, UAE and Spain will increase these power savings to 160 MW by early 2007. Our clients tell us that ERI has the best and most responsive technical support team in the industry - from SWRO P&ID review to commissioning assistance. As confirmation of these achievements, ERI just received the 2006 Environmental Exporter of the Year Award from the Export-Import Bank of the United States. Real MW savings and unmatched product support has made ERI the largest ERD manufacturer in the world today. We have always tried hard to be the best and we thank you for making us the biggest.

At the IDA Congress meeting in Singapore in October 2005, Mr. Pique offered a \$10,000 reward to anyone who could duplicate the energy performance numbers claimed in technical papers published by PEI Board member Dr. Irving Moch, Jr. This offer is still extant and unclaimed because 80% efficiency is not better than 95% efficiency, despite efforts by the turbocharger vendors to convince you otherwise.