Desalination and Water Treatment
www.deswater.com
8 (2009) 131–138
August
1944-3994 / 1944-3986 © 2009 Desalination Publications. All rights reserved.
doi: 10.5004/dwt.2009.673

The design aspects of rotary work exchanger for SWRO

Osamah M. Al-Hawaj

Mechanical Engineering Department, College of Engineering, Kuwait University, P.O. Box 5969, Safat 13060, Kuwait
Fax+965 484-7131; email: osamahalhawaj@yahoo.com

Received 3 September 2008; Accepted 4 May 2009

ABSTRACT

Seawater reverse osmosis plants, SWRO, are currently becoming increasingly more important compared to the less efficient MSF plants. The overall efficiency of SWRO plant is strongly dependant on the type of energy recovery device, ERD, used. Work or pressure exchangers, PE, are among the well proven devices for efficient energy recovery. The rotary work exchanger, RWE, technology is an improved pressure exchange concept characterized by its simple construction, high-pressure transfer efficiency and design flexibility. This paper discusses the operation and some of the design aspects of the RWE. Also, the paper presents a mathematical model for predicting the specific energy consumption and pumping efficiency of SWRO plant employing the RWE. Furthermore, the study performs a parametric analysis illustrating the significant effect of efficiency parameters of the RWE, membrane, and high-pressure pump on the performance of SWRO plant.

Keywords: SWRO; Pressure exchanger; Work exchanger; Rotary work exchanger