

Experience with seawater reverse osmosis SW30XFR-400/34i membrane at large desalination plant in United Arab Emirates

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ABSTRACT

A common difficulty with water purification processes using reverse osmosis membranes is biofouling, a phenomenon in which bacteria grow within the apparatus, sometimes as biofilm inside the membrane element. Biofouling reduces the membrane permeability and generates a larger than desirable pressure drop across the membrane, which could also eventually mechanically compromise the membrane element integrity. In industrial scale systems, it is not possible to completely remove the grown biofilm from within the reverse osmosis membrane, even using harsh cleaning conditions. This paper highlights the performance of the FilmTec™ SW30XFR-400/34, the new generation seawater fouling resistant membrane elements. The elements were operated using Red Sea seawater, known for its high biofouling potential. The operational results highlighted the improvement obtained when replacing the heritage FilmTec™ SW30HRLE-400 with the improved SW30XFR-400/34. The results complied over more than 2 y of operation demonstrate that the pressure drop was reduced up to 40% while keeping a stable normalized permeate flow and increased salt rejection.

Keywords: Seawater; Reverse osmosis; Fouling resistant; Membrane; Pressure drop; Biofouling

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