

Operating and maintenance cost in seawater reverse osmosis desalination plants. Artificial neural network based model

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ABSTRACT

The implementation of seawater reverse osmosis (SWRO) desalination plants was key to ensure the fresh water supply in arid and coastal regions. The high operating and maintenance (O&M) cost in these plants are an impediment. In this paper, the O&M cost of twelve SWRO desalination plants located in Fuerteventura (Canary Islands) were analyzed. A mathematical model was elaborated to estimate the O&M cost. The inputs were the production capacity of the line, recovery, energy consumption and the price per kWh. The specific cost related to the energy consumption is complex to be evaluated because of its dependence on other factors such as energy recovery system, chemical cleaning frequency and electrical energy tariffs. It was observed that the specific cost of the chemicals, cartridge filters, membrane replacement, staff and maintenance decreased with the production and recovery increase in the studied ranges. The model was verified with the data proving to be a good estimator.

Keywords: Seawater; Reverse osmosis; Operating and maintenance; Costs

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