

MODELING, SIMULATION AND OPTIMIZATION OF A REVERSE OSMOSIS DESALINATION PLANT

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ABSTRACT

Reverse osmosis modeling and simulation is essential in the design of a seawater reverse osmosis desalination plant. Proper procedures will result in designs that will help engineers and designers to come up with optimized plants. This article gives modeling, simulation and optimization of the V & A desalination plant located in Cape Town, South Africa. Mathematical modeling was assumed to be following the basic principles and equations of mass and transport theory. Simulation and optimization were accomplished using Water Application Value Engine simulation software. The optimization results showed a 7.3 % improvement in specific energy consumption (SEC) and about 18 % improvement in permeate productivity using the same membranes, recovery rate and feed total dissolved solids.

KEYWORDS: *Desalination, Reverse Osmosis, Modeling, Simulation, Optimization & WAVE Software*

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