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Optimization of the reverse osmosis seawater demineralization technologies for a power producing industry

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ABSTRACT

In the present work an optimization analysis of the main operating costs of the Black Sea water demineralization processes has been carried out. Several conventional and unconventional technologies utilizing membrane and ion exchange methods were considered. It is demonstrated that a double-stage reverse osmosis employing medium and low density membranes can be successfully used instead of conventional high pressure reverse osmosis for the demineralization of the Black Sea water. This allows decreasing main operating costs by 15–28%. Potable water can be obtained in membrane process without final remineralization by applying double-stage process based on nanofiltration and low density membrane elements. Main operating costs are by 15–35% lower compared with conventional seawater treatment processes.

Keywords: Seawater desalination; Membrane technology; Costs optimization

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