

# LONG TERM OPERATING EXPERIENCE OF SEAGUARD UF AS PRETREATMENT TO SWRO. TRANSLATING OPERATING EXPERIENCE IN THE MEDITERRANEAN SEA TO AFRICAN APPLICATIONS

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## **Abstract**

Numerous trials around the world have proven that ultrafiltration (UF) provides optimum pre-treatment for seawater desalination based on reverse osmosis membranes (SWRO). Ultrafiltration will remove all suspended solids and will provide a substantial reduction in microbiological activities. Plugging of RO spacers is completely eliminated and the RO cleaning frequency can be substantially reduced. The main obstacle against use of ultrafiltration membranes for SWRO pre-treatment has always been the higher operating cost of ultrafiltration when being compared with conventional pre-treatment. A new membrane has been designed with the aim of achieving the lowest whole of life cost while enabling membrane desalination of the most difficult to treat seawater.

This paper will describe two years of operational experience of the new Seaguard ultrafiltration membranes at Colakoglu Steel Mill and one year of operational experience at Nuh Cimento. Both plants are fed from the Gulf of Izmit near Istanbul in Turkey. The ultrafiltration pretreatment to seawater reverse osmosis is a pre-requisite to use of this seawater for membrane desalination.

It furthermore explains the decision making process for selection of pretreatment for the Uramin SWRO project. It shows how the results of full scale plants in other locations and an on site pilot project can be translated into a technical and commercial evaluation of the best pretreatment option for the desalination of water from the Atlantic Ocean off the coast of Namibia.

It will also describe how operating experience of full scale plants as well as pilot plants can be used to manage process and technical risks for future projects and to minimize the requirement of on site piloting. Case studies for several potential African desalination projects will be presented.

This paper describes the following topics the design and technical specification of the ultrafiltration pre-treatment systems, technical issues during construction and commissioning and process optimization and long term operational experience.