



RECLAIMING SOLAR POWER INDUSTRIAL WASTEWATER WITH CPA7-LD

Case study

Stabilizing System Performance with Hydranautics' Technical Support and Replacing Competitor Elements with Low Pressure, High Rejection CPA7-LD Elements

The

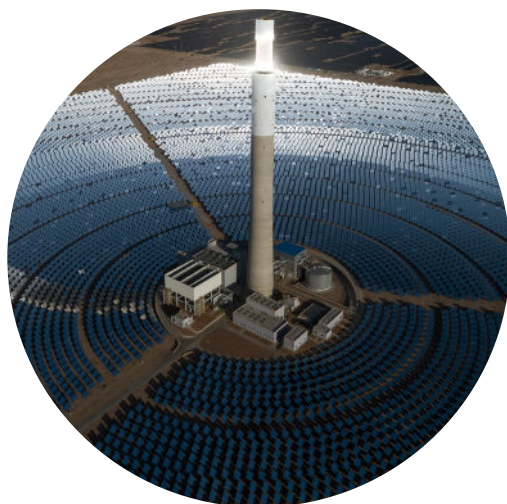
PROBLEM

A solar power station in Morocco collects solar radiation to heat molten salts for power generation. The molten salts are either immediately exposed to water for steam generation or stored for later consumption at night. The steam is then used with a turbine for power generation. The power station requires low salinity water for steam production for the power plant, for the cooling towers, and for cleaning the solar reflectors.

Along with the main water treatment system, the solar power plant was originally constructed with an on site wastewater treatment system. The solar power station had a goal to reuse all wastewater from the

plant's functions to minimize dam water consumption. The wastewater system was originally commissioned using competitor RO elements and **for nearly five years the wastewater was unable to be recycled** due to poor operation of the wastewater treatment system which resulted in poor permeate quality and excessive fouling.

The wastewater composition from the solar power station consisted primarily of media filter backwash water, wastewater from the coagulation tank, and cooling tower blowdown water.



Country	Morocco
Province	Marrakesh-Safi
Application	Wastewater Reuse
Model	CPA7-LD
% Recovery	65 %
Feed Water Type	Solar power station (industrial) wastewater
Feed TDS (mg/L)	2,476
Array	9:5 (7M)
Trains	3

The solar power station's wastewater reuse system pretreated the stations' waste streams first with ultrafiltration (UF) before being treated by three reverse osmosis (RO) trains. Each train was a two stage system operating at 65% recovery.

If the full system was able to operate within specification, the permeate from the wastewater reuse RO would be sent as feed water for the power station's cooling tower.

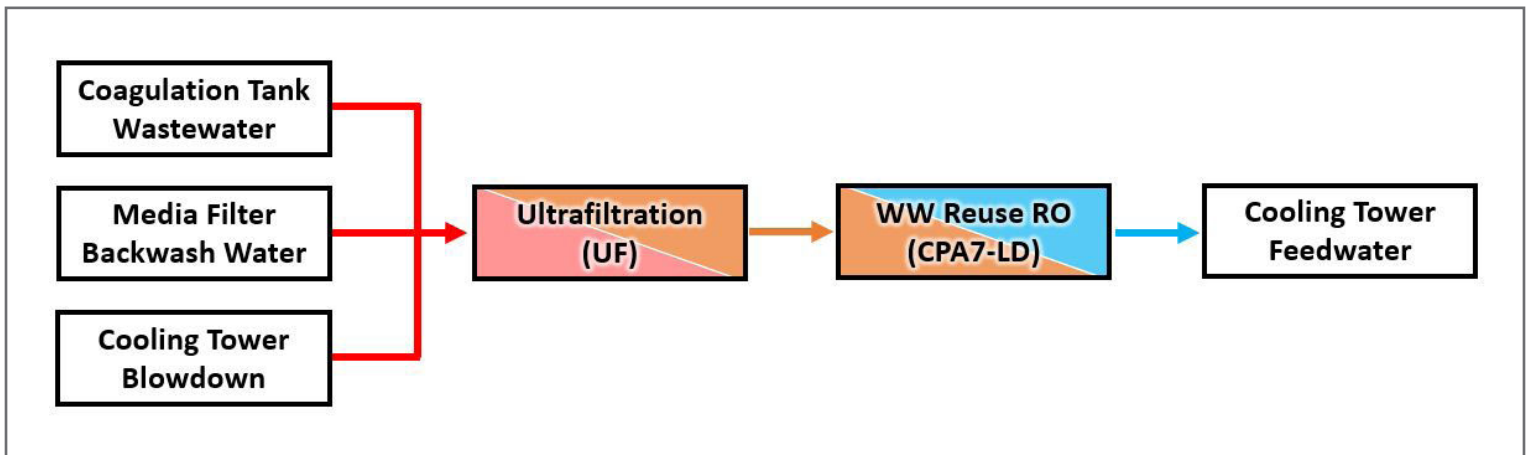
A technical commercial visit was conducted by Hydranautics' technical support team to investigate operation inefficiencies and mismanagement as well as replace competitor RO membrane elements with CPA7-LD in Train 3 of their wastewater reuse RO system.

After the on site investigation, the Hydranautics technical team made the solar plant station

aware of two specific points that could be addressed to improve system performance:

- Over dosage of SBS
- Inadequate chemical biofouling control

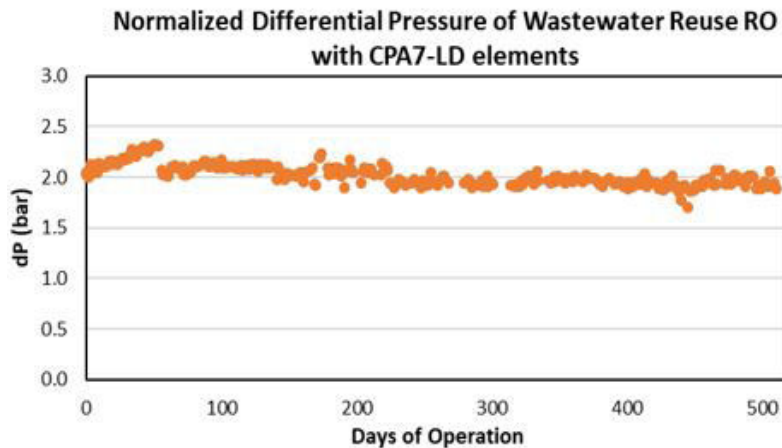
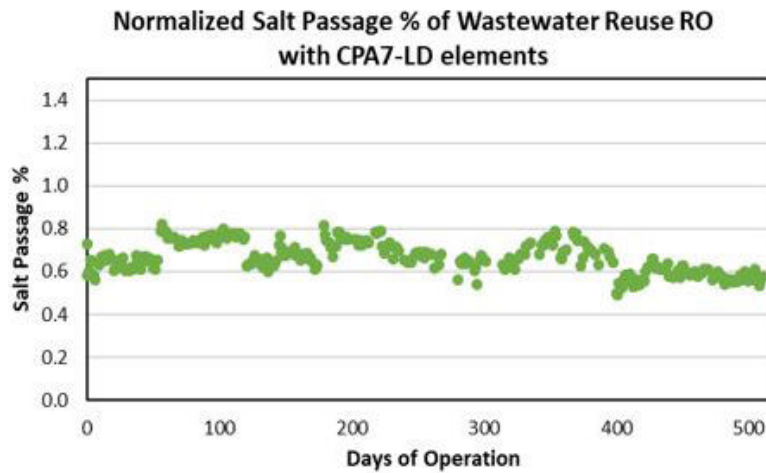
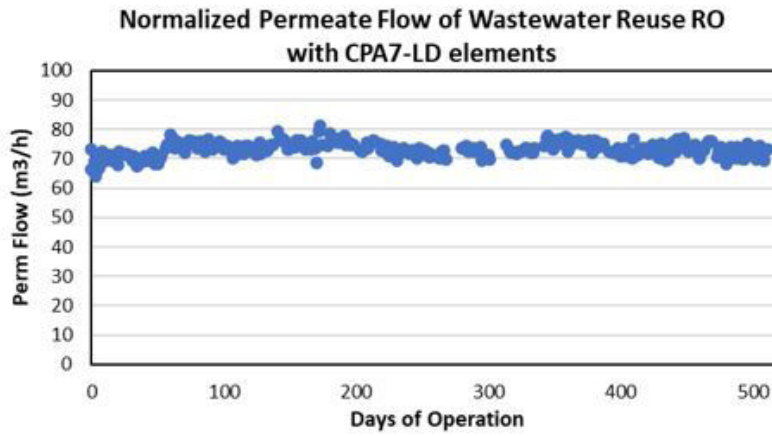
After implementing the suggested operational changes - reducing the dosing of SBS and revising the biocide treatment routine - from the Hydranautics technical team, the performance of all trains of the wastewater reuse RO systems stabilized. RO Train 3, which operated with CPA7-LD elements, exhibited stable operating parameters for longer than competitor elements in Train 1 and Train 2.



After implementing Hydranautics' pretreatment and upstream operation suggestions, the solar power station's wastewater treatment system has been operating at full capacity without any major fouling events. The CPA7-LD elements that replaced competitor elements in Train 2 operated with stable performance and were able to exceed the treatment system's quality requirements.

Before implementing Hydranautics' operation suggestions, Train 2 when loaded with

competitor elements required a CIP after 45 days of operation. With new pretreatment and loaded with the newly installed CPA7-LD elements, only 1 CIP per year was necessary. Train 2 has shown no decrease in performance parameters, even after 500 days of continuous operation.



For more information about Hydranautics case studies, contact us at hy-marketing@nitto.com or visit our website at membranes.com

About Hydranautics

Since our founding in 1963, Hydranautics has been committed to the highest standards of technology research, product excellence and customer fulfillment. Hydranautics entered the Reverse Osmosis (RO) water treatment field in 1970 and is now one of the global leaders in Integrated Membrane Solutions. Hydranautics became a part of the Nitto Group in 1987. Nitto is Japan's leading diversified materials manufacturer. The group offers over 13,000 high value specialty products worldwide including optical films for liquid crystal displays, automotive materials, reverse osmosis membranes for desalination and transversal drug delivery patches.

As leaders of high quality membrane solutions, we believe our commitments extend beyond manufacturing and selling our products. Our skilled staff of technicians, engineers and service professionals assist in designing, operating and maintaining a robust, reliable and efficient membrane system to meet your requirements and exceed your expectations.