RO Membranes' Protection

Industrial

Mejillones, Chile

RO Membrane Protection for a Desalination Plant in Mejillones, Chile

The Challenge

NORACID produces 720,000 tons of sulfuric acid annually for mining activities in the region and uses demineralized water to feed its high-pressure boilers for electricity generation. The seawater desalination plant presented several performance issues:

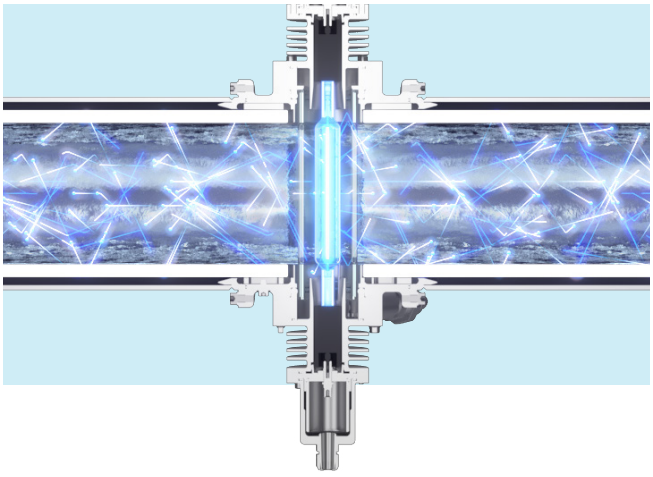
RO Permeate Flow:	30-35 m^3/hr
Membrane service life:	2 years
Cartridges replacement:	Every 4 days (average)
CIP frequency:	Every 13-30 days (average)
Chemicals:	Chlorine, SMBS, Ferric Chloride

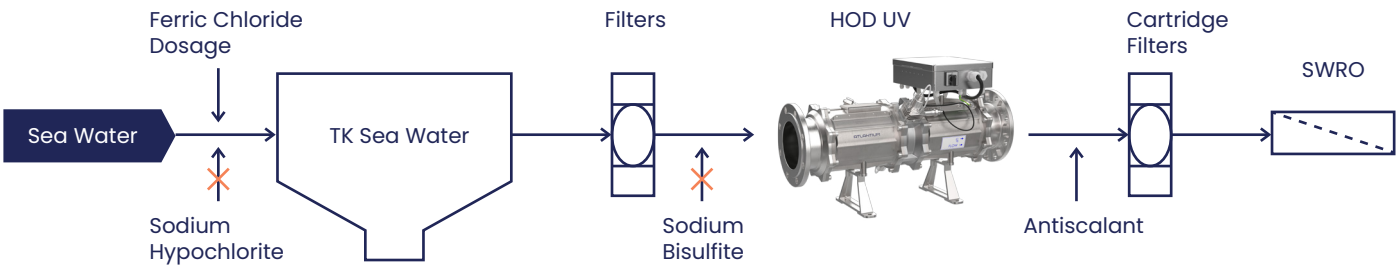
The Solution

In July 2022, NORACID installed Atlantium RZ series HOD™ (Hydro-Optic Disinfection) medium-pressure UV systems mounted vertically within a skid.

The goal of the installation was to evaluate the HOD UV system's efficiency in controlling biofouling on the RO membranes over a comprehensive 10-month study.

A key feature of the system, is its unique Total Internal Reflection (TIR) technology, which recycles UV light energy to ensure homogeneous UV dose distribution. This results in superior power efficiency and unmatched micro-organism inactivation.





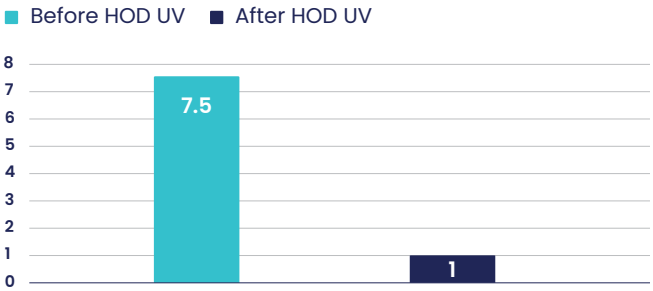
Results

The implementation of the RZ system led to significant improvements in the desalination plant's performance:

1. Elimination of chemical treatments – Chlorine & SMBS
2. 70% reduction in Ferric Chloride dosage
3. Extended cartridge filter life
4. Extended duration cycles between CIPs
5. Energy savings of 3% in electricity consumption per cubic meter of water produced

The success of the HOD UV system in controlling biofouling and improving overall performance at the plant not only met but exceeded NORACID's expectations. The effectiveness of HOD UV showcased its effectiveness as a pre-treatment solution in RO desalination processes.

Cartridges Replacement/Month



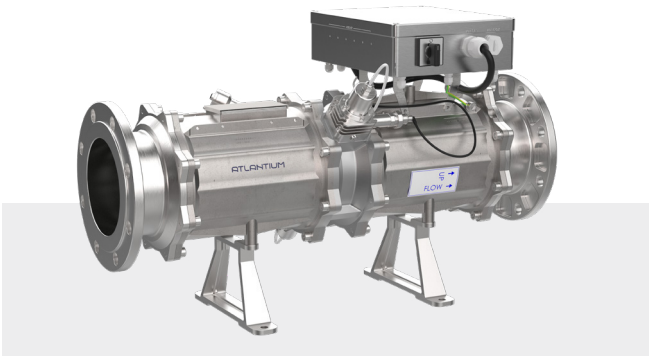
The study concluded that environmentally friendly HOD UV allows for the elimination or significant reduction of chemicals, aligning with the United Nations' 2030 targets. It provides the most efficient and environment-friendly solution, ensuring optimal pretreatment of seawater desalination plants.

Savings

37% Expected OPEX savings

63% Real OPEX savings

The comparison of operating results shows the economic advantage of implementing this pre-treatment with clear ROI and a significant increase in performance.



Annual Operating Cost Comparison
=> Return on Investment

Item	Without HOD UV (USD)	Real OPEX with HOD UV (USD)
Chemicals	21,918.60	534.60
Membrane cleaning	18,240.00	6,768.00
Microfiltration cartridges	18,264.00	2,401.92
Membrane lifetime (partial replacements) estimated	21,056.00	14,739.20
Indirect OPEX	6,000.00	1,440.00
UV lamps	-	4,000.00
Technical assistance (bimonthly visit)	-	1,920.00
Total operating cost (year)	85,478.60	31,803.72
OPEX savings per year	-	53,674.88

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About us

For more than two decades, Atlantium Technologies has helped to ensure water safety with its innovative HOD™ (Hydro-Optic Disinfection) UV technology and novel approach to performance, monitoring, and control. Atlantium's superior, environmentally friendly water treatment solutions ensure stable, efficient, and dependable production.

With thousands of full-scale installations for leading brands in various industries globally, we're committed to consistently meeting our customers' water quality needs, ensuring pure results.

Pure Performance

ATLANTIUM

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