



RO Membranes'  
Protection



Industrial



Asia

# RO Membranes' Protection at SWRO Facility, Asia

## Background

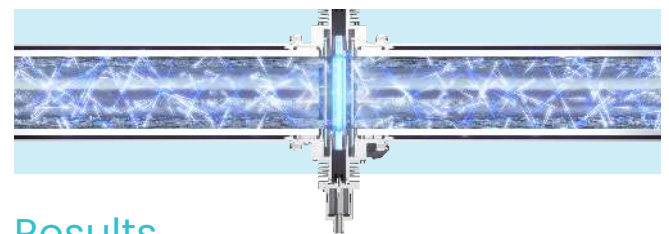
A seawater reverse osmosis (SWRO) facility in Asia with a 100,000 m<sup>3</sup> per day drinking water capacity employs a multi-stage treatment process including a clarifier, disc filter, ultrafiltration (UF) membrane, micron filters, RO and post-treatment. The RO system consists of 12 skids, each treating 750 m<sup>3</sup>/hr feed water upstream of the micron filters. In 2018, the SWRO facility undertook a comparative study to evaluate the disinfection efficacy of a novel HOD™ (Hydro-Optic Disinfection) UV technology to provide enhanced protection of the RO elements and positively affect overall RO system and facility performance.

Atlantium HOD UV systems provide effective RO membrane protection by combining ultraviolet water disinfection technology with hydraulic and optic principles. The HOD UV system features the unique Total Internal Reflection (TIR) technology that recycles UV light energy, ensures homogenous UV dose distribution, provides superior power (kW) efficiency compared to traditional UV, and achieves unprecedented biofouling prevention and micro-organism inactivation.

## The Solution

Membrane system operation and maintenance from six months prior to and following the installation of the HOD UV technology on RO Train 12 were evaluated. The HOD UV technology was installed in December 2018 on the RO skid line for RO Train 12, after the

UF membranes and before the micron filters. The study evaluated CIP frequency, DP post CIP, micron replacement, normalized permeate flow, and RO membrane replacement. Data was also compared to the performance from an unprotected RO train (RO Train 11) that was not treated by HOD UV technology.



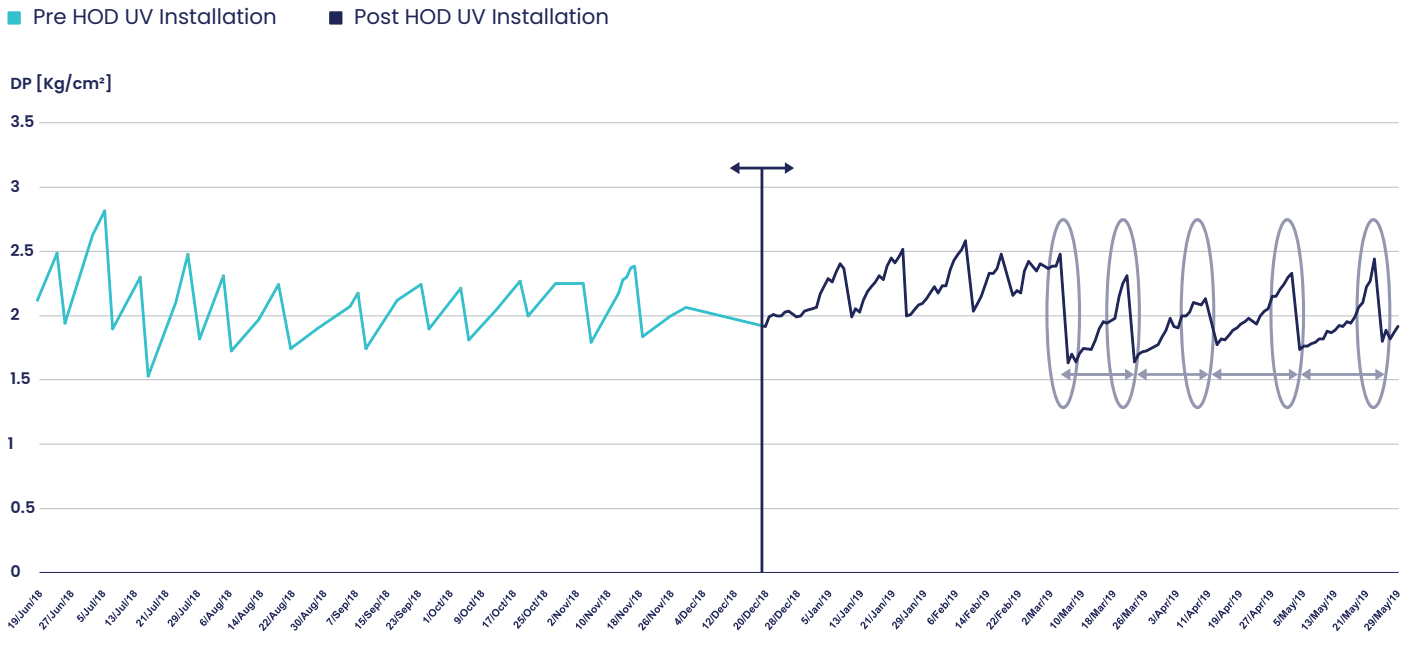
## Results

Following the installation of HOD UV, the facility experienced significant operational improvements:

- 50% decrease in SWRO CIP frequency
- 65% decrease in the number of micron filter replacements
- Membrane performance improved, with a 21% decrease in post-CIP DP

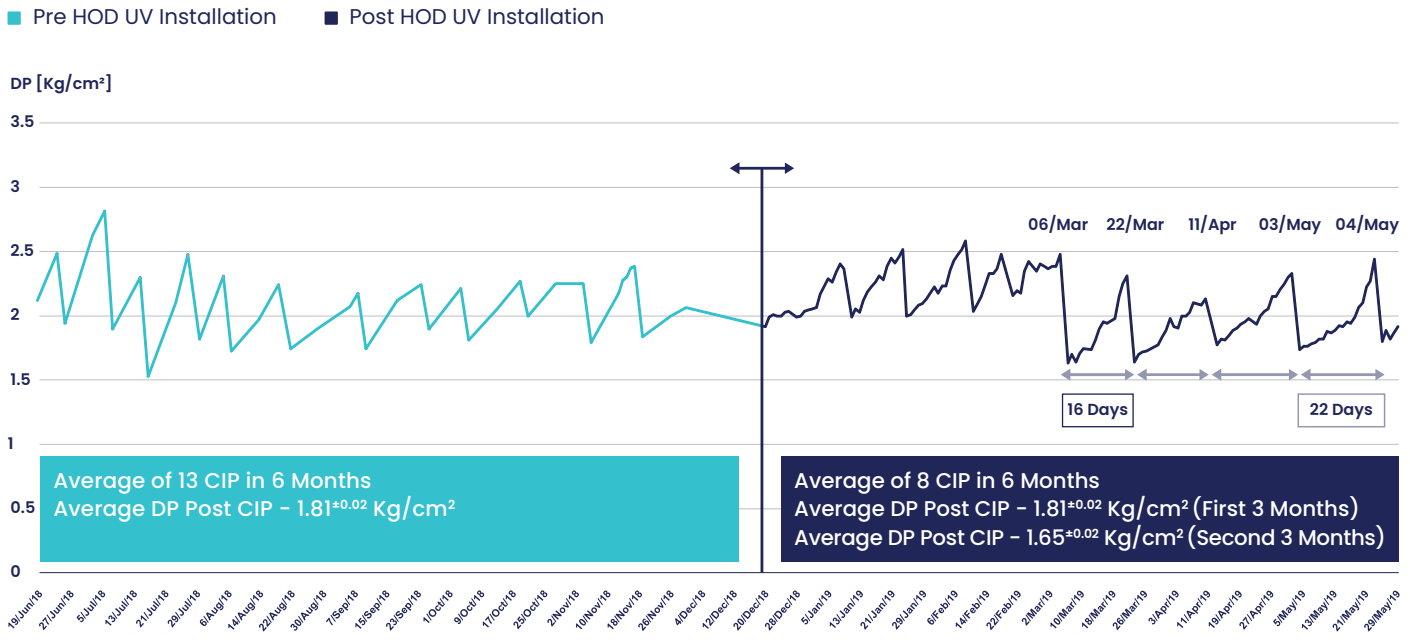
In conclusion, SWRO facilities experiencing frequent CIPs, micron filter replacement, and RO membrane element replacement can benefit from exploring the HOD UV technology as a non-chemical disinfection treatment approach to enhance the protection of the RO elements, extend membrane life, and positively affect overall RO system and facility performance.

### CIP DP Pre & Post HOD UV Installation



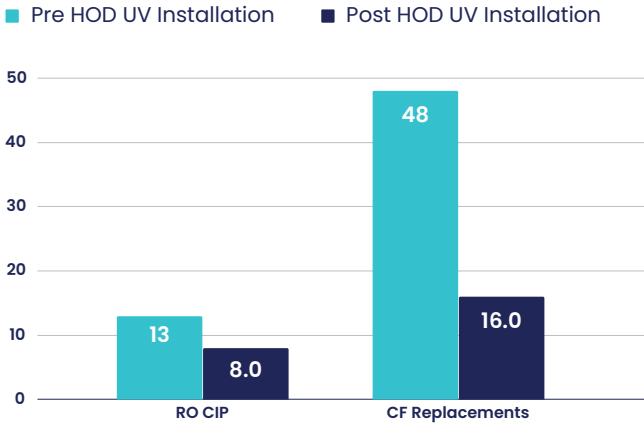
CIP is more efficient – 0.75 kg/cm<sup>2</sup> vs. 0.59 kg/cm<sup>2</sup> before HOD UV installation

### RO DP Pre & Post HOD UV Installation



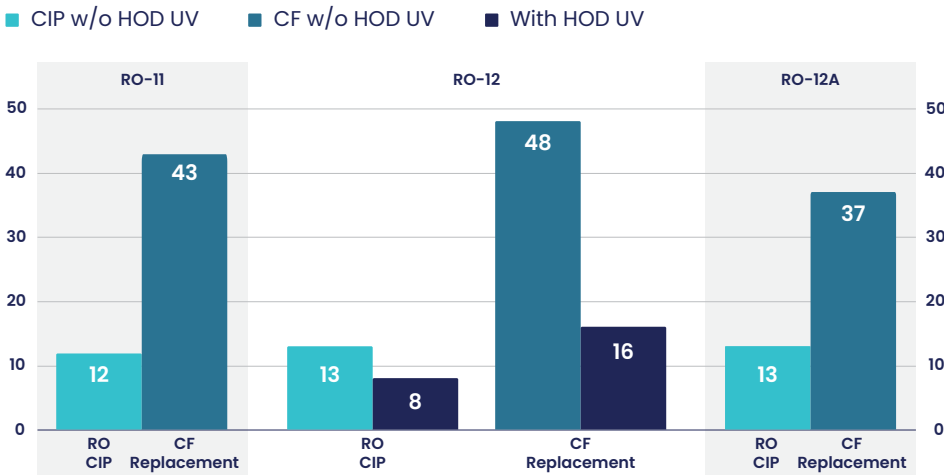
RO differential pressure prior to and post HOD UV technology installation

## Maintenance Procedures



RO CIP frequency and CF replacement frequency, six months before and after HOD UV installation.

## Maintenance Procedures



Performance data comparison for RO train with HOD UV protection (RO Train 12) and the same RO train six months before HOD UV installation (RO Train 12A), and for an RO train without HOD UV protection (RO Train 11).

## 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.

