



IntelliFlux Controls

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Case Study: Secondary Effluent Wastewater Membrane Testing Operations

Comparison of IntelliFlux real-time response to high and low fouling water treatment operations



Intelligent reactive cleaning improves performance during high and low fouling operations

IntelliFlux Controls (“IFC”) was selected to demonstrate its operational benefits at a municipal wastewater treatment facility in combination with the testing of multiple membrane manufacturer’s ultrafiltration membranes. IntelliFlux hardware-software solution was installed on the skid mounted system to optimize membrane operations as different membranes were tested with the same water quality but different membrane fouling propensities.

The existing ultrafiltration membrane system was equipped with automatic filtrate relaxation and backwash sequences of which IntelliFlux optimized:

- the time between cleaning operations
- the duration of the cleaning operation
- the intensity of the reverse flow rate during backwash

IFC worked with the operator to combine all the available variables into a matrix of different cleaning protocol options. IFC then assigned each cleaning protocol combination to a specific step number on an intensity scale ladder, which the IntelliFlux algorithm dynamically chooses based on the live performance of the system.

The IntelliFlux algorithm was constantly seeking the least intense but most effective step of the intensity ladder, which led to sizeable reductions in energy and chemical consumption while increasing the overall net recovery water produced. IntelliFlux equally will increase the intensity as fouling becomes unmanageable with the traditional static option, which leads to longer membrane life.

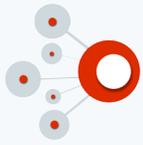
About Us

IntelliFlux Controls offers Artificial Intelligence (AI) driven self-adaptive expert control system that autonomously, in real-time optimizes water treatment plants.

IntelliFlux can be applied to all existing or new Microfiltration or Ultrafiltration membrane systems regardless of module or system including: hollow fiber modules, flat sheet modules, MBR systems, dead end filtration, and recirculation operations

IntelliFlux takes the responsibility of constantly optimizing your membrane system away from operators so they can work on higher level problems.

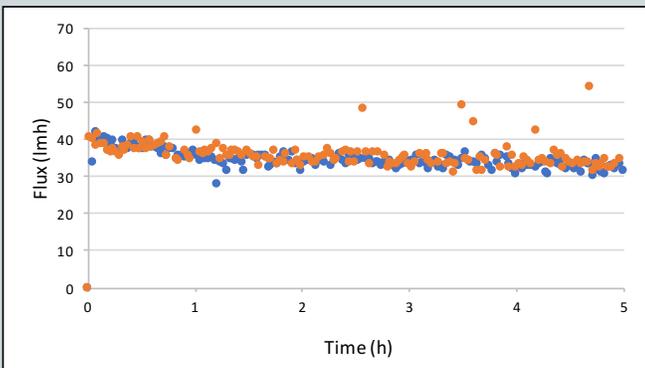
IntelliFlux cloud remote monitoring gives improved immediate access and insight to system performance and previously untracked influent quality fluctuations.



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Maintain Consistent Performance and Recovery

IntelliFlux is optimized to maintain flux and overall recovery through the membrane system. Even though the two membranes responded to the influent differently, IntelliFlux maintained steady operations and flux throughout the testing of each.



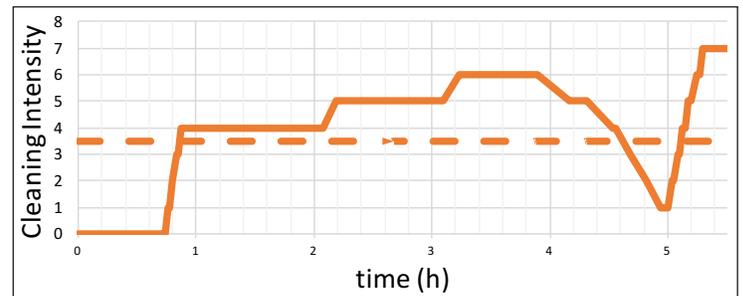
The graphs to the right show the cleaning intensity ladder on the vertical axis – the bottom of the ladder is the least intense, which uses the least amount of energy and backwash water, and the top of the graph is the most intense step, which is more capable of cleaning a heavily fouled system. The dashed line represents a typical static cleaning regime of the same backwash intensity for every cleaning.

All traditional static based membrane system cleaning protocols (represented by the dotted line) are consistently either over cleaning or under cleaning the membrane. IntelliFlux is the only solution that intelligently optimizes membrane cleaning in real-time.

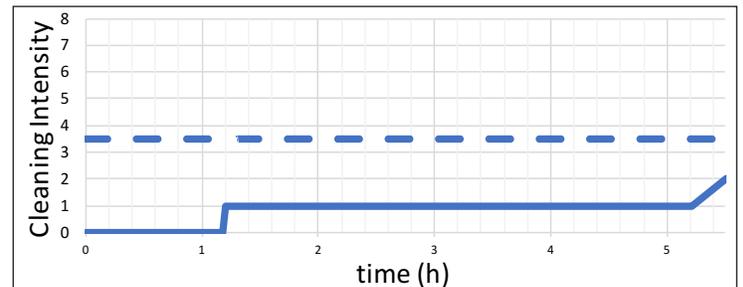


Adapt to varying fouling

The first membrane tested had difficulty treating the wastewater and quickly stepped up through the cleaning intensity ladder into the more intense cleans. IntelliFlux maintained steady operations but the overall recovery and OPEX costs would suffer on a system that chose this membrane for the given influent.



The second membrane installed easily treated the wastewater and maintained low intensity cleans throughout the test. IntelliFlux automatically maximized the recovery and reduced the OPEX costs of the same system in real-time.



Customer Testimonial

"We tested IntelliFlux for several months on two of our wastewater treatment units, and after we saw how efficiently it maintained the membranes, we decided to outfit our entire 200 trailer fleet. Now, with IntelliFlux, our operators spend almost no time worrying about the membranes, whereas earlier, maintaining the membranes was nearly a full time job."

Alan. R. Pyle, CEO, WaterFleet