**PennWell**
Industrial
Water World

Automation

Software Warns of Early Membrane Fouling

A software system known as MASAR® – Membrane Alarm System and Automated Reporter, is proving to be a valuable tool for monitoring and optimizing membrane – based water purification and desalination plants. It can detect the early development of membrane fouling/scaling in RO, NF, UF and MF systems by monitoring performance and measuring an early-warning parameter called the Fouling Monitor™ (FM).

Membrane manufacturers and water plant operators have traditionally been using the industry-standard normalization method (ASTM D-4516-00), Standard Practice for Standardizing Reverse Osmosis Performance Data). It produces a long-term flux decline performance trend by comparing the normalized product flux and quality performance to design projections under the same conditions.

NF Train Performance
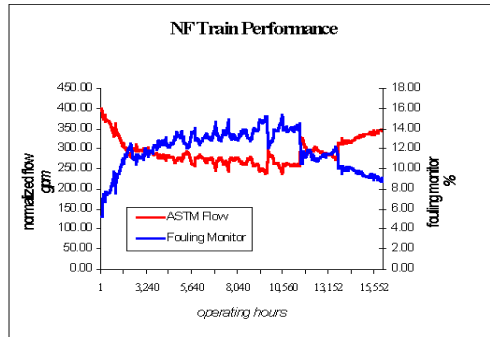
The FM, on the other hand, is based on detecting and quantitatively measuring membrane fouling or scaling as soon as it starts to develop in the system in real-time, eliminating the need for the long-term, ambiguous trending analysis.

The MSWIndows®-based software, designed to be user-friendly and error-proof, also can serve as an integrated plant performance optimization, data management and reporting system. Operating data can be entered manually, imported from data acquisition systems or transferred from existing spreadsheet or database files, including most membrane manufacturers' normalization programs.

The company licenses a limited version of the software package, applicable to one RO or NF train. Other customized licenses are available to fit any seawater, brackish or wastewater plant with multiple trains, UF/MF arrays. Single or double-pass with single or multi-stage designs. The system also can be customized to meet customers' data input, output, display, reporting and graphics requirements.

Using real data from a Nanofiltration (NF) treatment train in a comparison between the MASAR® software FM method and the ASTM D-4516-00 standard normalization method, the FM method indicated membrane fouling earlier on, and the NF membrane elements suffered from a defect that caused continuing deterioration in performance, which was indicated by the MASAR® evaluation. The plant's daily monitoring procedures failed to pick up the NF membranes real behavior and indicated a totally different trend.

Using MASAR®'s Fouling Monitor™ can give the operators a true an dearly indication of membrane system performance and fouling status. Operators can investigate the sources of deterioration, such as biofouling and element defects, and implement corrective measures before the system's productivity is seriously impaired.

"The new software can be a very valuable tool to closely monitor and optimize the operation, performance and cost-effectiveness of water membrane filtration plants, and for determining the actual effect of any changes in design, process or operational conditions," said Joseph Richardson,
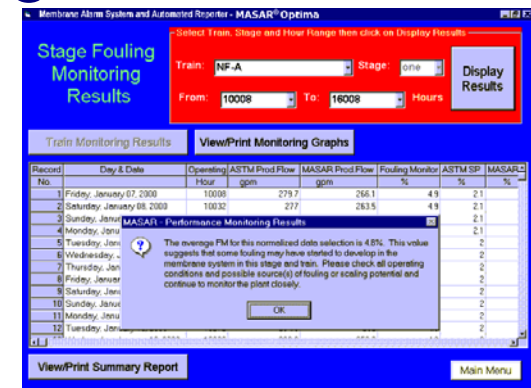
Plant Operator at the Port Hueneme Water Agency's Brackish Water Demonstration Facility. "Based upon the demonstrated ability of the MASAR® FM software, I am supportive of the software set, which I know to b superior to the software we were provided by the membrane manufacturer."

In a letter to the company, K.G. White, Product Manager for Permasep® Products said, "Permasep® Products approves and recommends the use of your MASAR® software technology applied to RO plants using our membrane products."

A multi-media demo is available at *www.masar.com*. The company also offers a monthly plant monitoring and evaluation service in which plant operators transmit train operating data files by e-mail and receive back a monthly report of system performance evaluation and fouling status as well as recommendations for action. A special alert is issued as soon as fouling early development is discovered so that plant operators can take immediate corrective steps. *WW*