Monitoring RO Performance

The simplest monitoring for RO systems measures the conductivity of the product on a periodic basis. However, this minimal level of monitoring will virtually guarantee a premature failure of the RO system. *RO systems require a robust monitoring and data analysis effort to track the system performance and implement timely corrective action such as off-line cleaning.*

BE PREPARED TO REPLACE SEALS

Failed or improperly installed seals often cause poor permeate quality. Carefully install seals and keep spare seals in stock to maintain RO product quality.

Proper monitoring requires measuring and tracking the change in the value of each key parameter. Operators must correct each data point to account for dynamic operating parameters to properly evaluate the changes in key parameters. These dynamic operating parameters include the effect of temperature changes on water density, membrane aging, and accumulation of contaminants in the membranes. This "adjustment" calculation is called normalization. When the changes in normalized data exceed the maximum specification limits, operators must clean the membranes to avoid permanent loss of membrane capacity.

INCREASING PRODUCT FLOW VOLUME

Consider controlling the temperature of the feed water using direct injection of low pressure or waste steam to maintain the recovery rate in cold weather.

Don't exceed the maximum feed temperature for the RO membrane as shown in Table 5-3!

The key parameters are:

- **Normalized product flow—**Declines of more than 10% indicates a need to clean membranes.
- **Normalized salt passage—**May or may not change with fouling; will increase with scaling; increases of more than 10% indicate a need to clean.
- **Pressure drop—**Increase of 10% or greater than 50 psi per stage indicates a need to clean.