Analysis, Monitoring and Prediction of SWRO desalination plant

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The present study evaluates monitoring and prediction of a full-scale sea water reverse osmosis (SWRO) desalination plant which deals with the application of multivariate analysis of variance (MANOVA); Principal Component Analysis (PCA), hotelling's T2, Q chart and VIP plots using data collected from full-scale SWRO desalination plant in Korea. MANOVA is used for statistical hypothesis testing for two stages Pore controllable fiber filter-reverse osmosis (PCF-RO) and Sand filtration-ultra filtration-reverse osmosis (SF-UF-RO) models PCA is applied for dimensional reduction of data collected. Hotelling's T2 and Q chart statistic is used for the monitoring of the process. Variable importance in the projection (VIP) plot generates the influential parameters on the permeate stream. The results shows that multivariate statistic process control (MSPC) techniques such as PCA, and control charts such as Hotelling's T2 and Q chart statistic can be effectively applied for monitoring of SWRO desalination plant.
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