PALL Power Generation

Case Study

Texas Plant Revamps its RO Pre-treatment with Pall Aria™ Microfiltration System

Introduction

Until 2002, a supercritical plant in Texas equipped with three 750MW Westinghouse steam turbines and CE tangential supercritical boilers, was using a clarifier for pre-treatment of cellulose acetate RO membranes to provide condensate make-up.

The Problem

The large clarifier exhibited signs of corrosion due to the acidic treatment of the water in the process. In addition, the quality of the water was deteriorating, and conductivity increased due to ferric sulfate and caustic addition. The plant also reported difficulty in stabilizing water chemistry: an average of 2 or 3 days to stabilize the system after a change in demand or influent chemistry.

The plant was experiencing an increase in the cost of chemicals (up to $50,000/year) to try to catch up with a failing and deteriorating system. Initial estimate of repair and upgrade to the clarifier system was $300,000.

The Solution

A Pall Aria™ automated microfiltration (MF) system was used to replace the entire pre-treatment train. The system treats raw water from the 77,000 acre lake nearby for use in the plant RO system.

The Pall Aria solution comprises two AP-4 systems totaling 600gpm capacity. Both units are controlled from a single PLC and maintain consistent water effluent to the RO system, without chemical treatment. Water quality is maintained at 0.04 NTU.

Since installation in February 2002, the Aria system has been providing high purity water with minimum intervention and greater degree of flexibility to the plant.

Pall AP-4 Aria microfiltration system to treat 300 gpm (total output for 2 AP-4 is 600 gpm to the plant)

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The Benefits

- A consistent water quality of 0.04 NTU out of the Aria system, for a wide range of upstream water conditions
- At least 6 months operation between CIP (clean in place)
- The ability to change flow on demand from the PLC without major adjustment
- Reduction of the maintenance required for the pre-treatment process by a factor of 6
- Extension of the service life of the filter element upstream of RO, from 3 days to over 6 months.
- A great reduction in space needed for water treatment (by over 60%)
- 6-month Return on Investment
- Reduced man hours by 100,000 hours
- Chemical reduction of $50,000 per year
- Savings of $250,000 per year, previously spent on filter media for clarifier
- 3 years with 0 hours downtime
- Savings of $2000 per month, previously spent on Polymer addition
- First year savings of $500,000

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