

CO-Generation Plant

Situation: A new co-generation facility at a West Coast college campus was started up using traditional chemical treatment with hard city water and operated with high tower water wastage (1.5 to 2.5 COC). Use of traditional chemical treatment was specified in order to meet the equipment warranty of the contractor and manufacturers of the chiller / absorber / exchanger / cooling tower systems. The stainless plate and frame exchanger required operation at up to 200^o F, and scaling required shutdown for scale removal about every three months of operating time. Reducing the tower water COC to lower concentrations of hardness with increased chemical residuals was still ineffective in preventing recurring exchanger scaling.

Solution: After a year of failing to maintain specified performance of the co-generation system, the decision was made to use the WCTI soft water and zero blowdown process that had been operating for four years at this college with outstanding scale and corrosion control performance in a separate central cooling plant system. The main benefits were **no tower blow down** and **no chemicals** to maintain the system. The cooling tower now operates at 40 COC!

Results: The facility has now operated the co-generation system for over 18 months without an exchanger shutdown, and upon inspection, the design contractor and facility engineer were amazed by the spotless scale free condition. Elimination of blowdown provided water and sewer cost savings for rapid ROI on the WCTI equipment, and permanent operational cost savings for the facility. The WCTI process provides corrosion rates for mild **steel** and **copper** coupons **below 0.1 mpy**, far better than the traditional chemical treatment. Further, no chemical use and handling is required, and biological growth is mitigated. The engineer stated that performance was better than 30 years ago when he used chromate and acid treatment.

Cost Savings: The facility has been able to realize water savings with zero tower blowdown for annual water use reduction of over **3 million gallons!** The water cost savings provided equipment payback for less than **12 months ROI!** Maintaining energy efficiency for the exchanger / co-generation process and elimination of maintenance downtime provide even greater operational and economic benefits.

Scale formed every 3 months before



Heat exchanger after 18 months on WCTI

