

RO System Saves Over US\$83,000 in Energy and Water for Boiler Feedwater

Challenge

GE was invited to work on the design of a boiler feedwater system by a key corporate customer. The application was for a new construction site and the goal was to determine the most economical and efficient way to implement a water treatment system for a 38 bar, 308 gpm (70 m³/h) boiler with a proposed future expansion capacity of 440 gpm (100 m³/h).

Solution

After a detailed analysis of the raw water quality, site layout and required feedwater quality GE recommended the following water treatment system.

The GE integrated system comprised pre-treatment (Multi-media and Activated Carbon filters) and Reverse Osmosis (RO) technology. Several unique design features reduced energy and water usage by reusing the concentrate water in backwash and once-through cooling applications

GE also used the excess RO permeate water as partial make-up to the cooling system to limit the raw

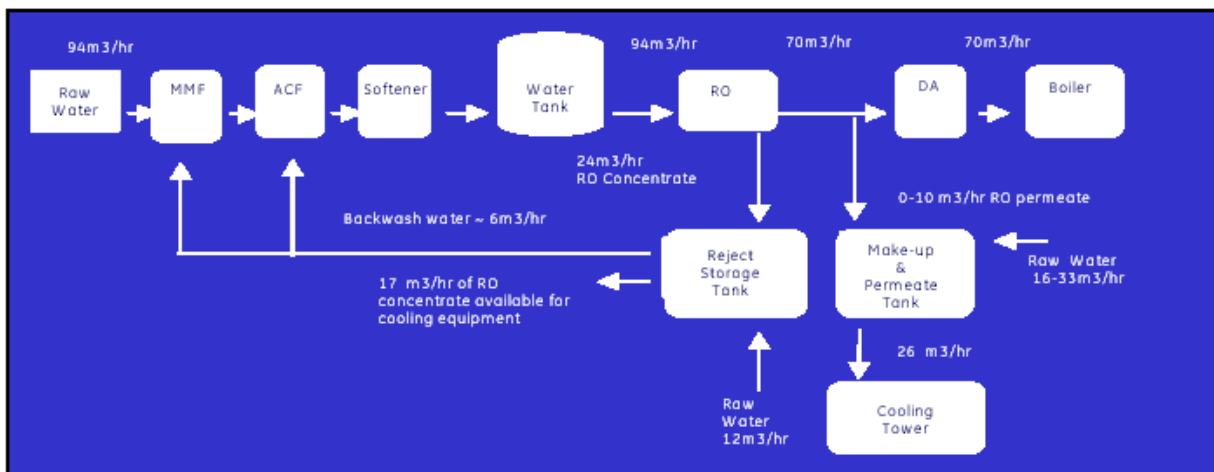
water usage, increase the cycles of concentration and reduce the chemical treatment cost for the cooling system. Finally, the GE design used excess plant energy to preheat the raw water to the RO system to reduce the boiler energy requirements.

Results

The customer realized several areas of savings by using the GE designed system including:

- Documented savings shown through GE economic models of US\$40,137 in annual operating costs simply by using an RO versus a demineralization system.
- The use of concentrate water within the process cooling system and site backwash water saved US\$39,516 in annual water costs.
- Understanding the production process enabled GE to indirectly heat the feedwater with a hot process stream, saving an additional US\$4,301 in annual energy costs.

In total the use of the GE design combined with our technical knowledge and process experience resulted in annual cost savings of US\$83,954.



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