CASE STUDY

Wise County Power Plant

Wise County, TX

SMALL FOOTPRINT | PROVEN TECHNOLOGY | EXPERIENCED | COST EFFICIENT

Wise County

Makeup Water Treatment and Zero Liquid Discharge System

suez environnement | Degrémont

GEA

HEADWORKS | BIOLOGICAL | SEPARATIONS | MEMBRANES | OXIDATION-DISINFECTION | BIOSOLIDS | INDUSTRIAL SYSTEMS

Wise County Power Plant

Makeup Water Treatment and Zero Liquid Discharge System

Background

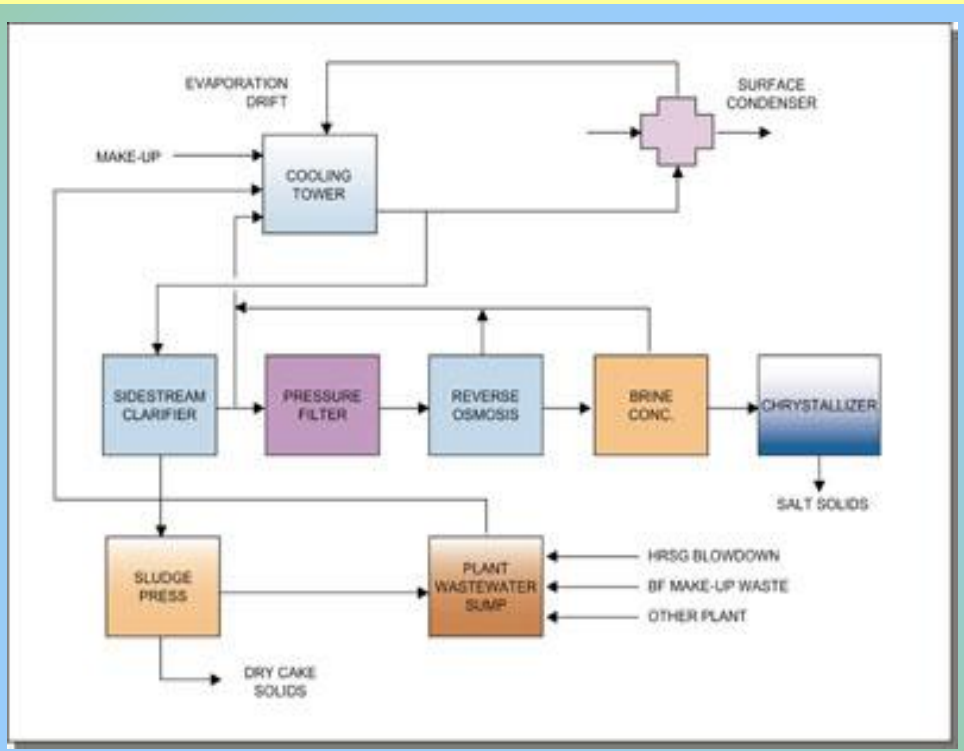
Tractebel North America began construction of a new 720 MW, natural-gas-powered plant in southwestern Wise County in 2001. In support of this project, Infilco Degremont, Inc. provided a complete treatment system including pretreatment of makeup water and continuous side stream treatment of the cooling tower blowdown. This process provides for 100% reuse and only discharges dewatered solids (crystals).

Degremont Technologies Solution (See Block Diagram)

Approximately 3,500 gpm of surface water from Lake Bridgeport is treated with ferric sulfate and polymer for the removal of suspended solids and aluminum and partial removal of total organic carbon (TOC) in one of IDI's patented DensaDeg Clarifier/Thickeners. In addition, sulfuric acid is fed to the clarifier to produce optimum pH for organics (TOC) removal and/or to control alkalinity levels to the cooling tower.

The 500 gpm Side Stream Treatment System includes two distinct parts. The first includes lime soda softening in another DensaDeg Clarifier/Thickener for removal of hardness, alkalinity, silica and some TOC. All but 200 gpm of this clarified/softened water is returned to the cooling tower.

The other wastewater is treated by reverse osmosis for removal of TDS and concentration of the wastewater. The RO permeate (~140 gpm) is directed back to the cooling tower basin to dilute TDS in the tower. The concentrate (~60 gpm) becomes the feed for the brine concentrator. The brine concentrator consist of a falling film evaporator and a rotary drum dryer which creates salt crystals from the dissolved solids as the water is driven off. The crystals taken off-site for disposal and the condensate is also returned to the tower.



Customer Benefits

- The brine concentrator is the most expensive piece of equipment from both capital and operating perspectives. The use of lime soda softening and membrane filtration efficiently concentrates the wastewater prior to brine concentration and requiring a much smaller unit.
- The use of Side Stream Filtration is much more efficient than end-of-pipe treatment.
- DensaDeg® clarifiers' superior rise rates (8 to12 gpm/ft2) result in a smaller footprint and lower capital costs.
- Degremont provided a 'one source' solution.

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