

## Zhuhai --A Membrane Based Water Treatment Plant

### The Facility

At the time it was built, the Guangdong Zhuhai Power Station set a number of firsts for China. Not only was it the largest thermal power plant in terms of unit size, it was the first to use Reverse Osmosis Water Treatment and it was the first to be financed without a multilateral or government guarantee. Zhuhai was also EPC Mitsubishi Heavy Industries' first turnkey contract in the PRC.



### The Problem

The feed water for the power station's needs is river water which contains high organics and high dissolved solids

### The Solution

Aquatech determined that the water would first need to be pre-treated. For this task, two units of Tube Settler Clarifiers each of 600 M<sup>3</sup>/hr, three Gravity Filters each of 135 M<sup>3</sup>/hr, all the other auxiliaries and chemical dosing units were provided.

For the boiler make up water, a Demineralization Plant which contained the following was provided: Two Sodium Zeolite Softeners each of 165 M<sup>3</sup>/Hr; Two Reverse Osmosis trains each of 62 M<sup>3</sup>/Hr --permeate at 75% recovery; One Decarbonator of 124 M<sup>3</sup>/hr; Two SAC/SBA/MB trains each of 124 M<sup>3</sup>/hr and all other auxiliaries including regeneration skids, dosing skids, RO clean up skid, etc.

Aquatech also provided a wastewater treatment plant for neutralization and solids removal/sludge volume reduction. This system included two clarifiers each of 110 m<sup>3</sup>/hr, a filter press at 1.4 m<sup>3</sup> capacity and a neutralization system at 110 m<sup>3</sup>/hr.

### The Results

The water treatment systems for Zhuhai were successfully commissioned in 1998 and have been operating successfully since then.

#### Water Analysis

	(in MG/L as Ion)	
	RO Feed	RO Permeate
NH <sub>4</sub> Ammonia .....	0.1	0.0
K, Potassium .....	7.6	0.1
Na, Sodium .....	297.6	3.5
Mg, Magnesium .....	0.0	0.0
Ca, Calcium .....	0.0	0.0
Sr, Strontium .....	0.0	0.0
Ba, Barium .....	0.0	0.0
HCO <sub>3</sub> Bicarbonate .....	122.0	1.5
NO <sub>3</sub> Nitrate .....	0.8	0.0
Cl, Chloride .....	349.6	4.2
F, Fluoride .....	0.0	0.0
SO <sub>4</sub> , Sulfate .....	61.4	0.6
SiO <sub>2</sub> , Silica .....	7.1	0.1