

# *ENERSAVE UF/RO Systems for Shanghai Chemical Industry Park Caojing Co-generation Power Plant*

*Enersave did it again! Continue from the success in providing the largest RO demineralization system in South East Asia, Enersave extends its technical know how to Far East region to provide one of the largest UF and RO systems in the region to supply demineralized water to Caojing Co-generation Power Plant in Shanghai Chemical Industry Park.*



Shanghai Chemical Industry Park (SCIP) lies at the north coast of Hangzhou Bay with total planning area of 29.4km<sup>2</sup>. SCIP is one of the industrial projects with the highest investment in China. It is the first industrial zone specialized in the development of petrochemical and fine chemical businesses, and also one of the four industrial production bases in Shanghai. SCIP is set out to be one of the largest and the most integrated and advanced petrochemical hubs in Far East.

Caojing Co-generation Power Plant was set up to provide demineralized pure water and electricity to petrochemical companies located in the area. The power plant is using natural gas, piped from north-west China, as fuel to generate steam and power. It is set to be highly sophisticated and efficient, with nearly 87% of heat from natural gas converted into steam and power. By comparison, a conventional plant can only convert about 50% of heat into power.

For this extremely challenging project, the largest of its kind in China, Enersave was chosen as the turnkey contractor to design, build and commission this fully-automated water treatment plant. Selection of Enersave from the international list of bidders by the client was a rigorous and involved process. In making the award, comment was made that Enersave is a leading technology provider in the field of water treatment. Enersave has accepted the challenge to build this multi-million project in 10 months, and is on track to meet the April 2004 target hand over date of the plant to the client.

Since Enersave is a wholly integrated water and wastewater company, group resources were utilized to telescope the design, procurement and fabrication stages ensuring that the extremely rigorous program was met. Major components were delivered to site when only the slab, concrete frame and roof of the water treatment building had been completed. These units were protected by a scaffold frame and sheeting. The bulk of pipe fabrication and erection was carried out while general construction was being completed.

There were no commissioning problems indicate the success of Enersave's Project Quality Plan (PQP) and commitment to Clean Build techniques.



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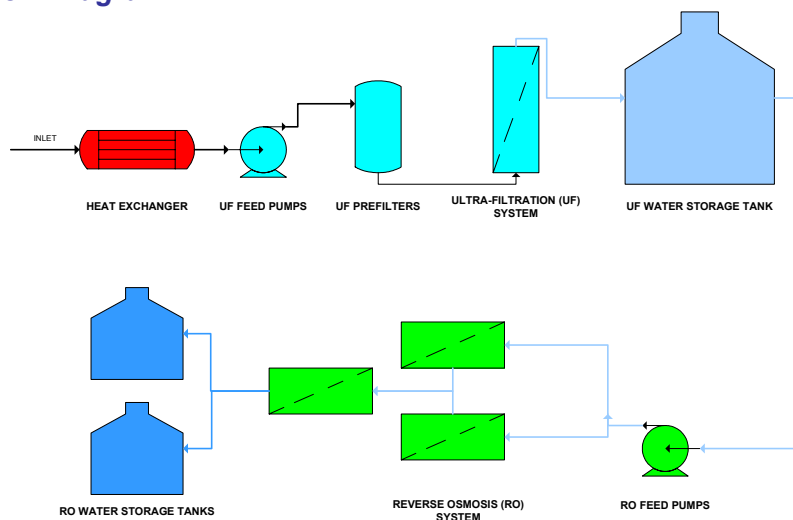
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# ENERSAVE UF/RO Systems... ...The Technical Know How

Since the whole Chemical Industry Park was new as was the delivery pipelines and primary treatment plant, a series of extensive pilot tests was carried out. From these the proposed treatment of water suitable for condensate polishing with Ultrafiltration and Reverse Osmosis offered by Enersave was accepted.

This water treatment plant comprises four skid-mounted UF systems, each with a capacity of 335m<sup>3</sup>/hour as pre-treatment, and four 250m<sup>3</sup>/hour RO systems. Feed water is supplied from local rivers and treated by settlement and rapid gravity sand filtration before delivery to the water treatment plant. These systems are to reduce the organic and salt content in the feed water rendering it suitable as feed to the downstream demineralizers.

## Process Flow Diagram



## Performance & Benefits

The selection of UF over the conventional MMF/ACF prior to RO/DI process has given the RO/DI system:

- ✧ An absolute barrier to remove all colloidal and suspended materials in the feed water. Six-log (99.9999%) removal of bacteria and over four-log (99.99%) removal of viruses.
- ✧ Very adaptable to fluctuations of feed water quality, upto 50 NTU in turbidity and 20ppm TOC levels with consistent product water quality
- ✧ Longer lifespan of the RO membranes due to consistent and improved RO feed water with SDI < 1.
- ✧ Reduced frequency of RO chemical cleaning, savings of chemical use and off-line time.
- ✧ Great savings of flushing/backwashing water and little off-line time with UF's short duration and automatically sequenced flushing/backwashing of the capillary fibers.
- ✧ Savings in cost of ownership with much reduced foot print requirement.
- ✧ Easy scale up (modular system) for future expansion.

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