

SPECIAL REPORT

Wastewater management for the world's largest refinery



Ion Exchange recently commissioned the water and waste water management project for the Reliance Industries' Jamnagar Export Refinery Project. A report.

The project

Reliance Industries enhanced the capacity of the Jamnagar Refinery to 1,200,000 barrels per stream per day (1,200K BPSD) with the commissioning of the Jamnagar Export Refinery Project (JERP) in Gujarat. In 2006, Ion Exchange was awarded the contract for the execution of the water treatment plant.

Project Execution

The projects were executed on a turnkey basis to meet the critical process quality & time schedules of Reliance

and Bechtel (project consultants). Reliance's world class ability in project resource support and professionalism catalysed early completion of the project during the peak resource (material and manpower) crunch experienced by the Indian economy in 2007-08. For the execution of this project, there was an exclusive team for detailed engineering (civil, electrical, mechanical, instrumentation), process design (expertise from Ion Exchange and Waterleau Belgium), project management and operating the sys-

tem. The construction activities were outsourced. Thus at any given stage of the project, there was an average 75-100 people working exclusively on this project.

Project delays

There were stage delays due to factors beyond our control, but ultimately we delivered the water treatment plant and the state-of-art effluent treatment plant without affecting Reliance's project needs.

The facility

Desalinated water is fed to

the 13 x 388 m³/h demineralisation plant consisting of mixed bed units to demineralise water for the boiler water turbine and for process use. The 3 x 388 m³/h condensate polishing units treat the return condensate at the refinery complex and captive power plant. The condensate, after treatment, is returned to the plant for reuse as polished feed water for low pressure and higher pressure steam generators. The return condensate is treated for removal of oil traces and low levels of dissolved solids by activated carbon filtration and ion exchange process.

The waste water treatment is carried out in a dedicated state-of-the-art completely automated and PLC-operated effluent treatment plant supplied by Ion Exchange, Waterleau. The effluent treatment area is designed to contain and treat all internal process/utility wastewater and storm/fire water, with the objective of zero discharge from the new refinery complex. The treated water is recycled back to the high total dissolved solids treatment train or guard tanks, as required.

Technology used

- Effluent treatment plant
- A 'state-of-art two stage biological process with zero discharge' of treated effluent
- Completely automated system with monitoring and controlling of process parameters by a SCADA/PLC control.
- Flexibility to interchange effluent streams (4 x 500

m³/h) automatically without affecting process and operation sequences

Learning Experience

While working on this project, Ion Exchange got the opportunity to work with arguably the best company in the world with its unbeaten record of project management which includes completing projects within shortest time with quality deliverables and best safety and HR records. Also keeping pace with Reliance's systems and critical project schedules was a great learning experience.

Major challenges

- Completion and commissioning of the project on time, without affecting Reliance's overall needs of water & waste water management & their project commissioning
- Aligning ourselves to the health, safety, quality & documentation (the best in the world) standards practised by Reliance for their projects
- The peak of Indian economy during project execution led to severe resource crunch (material, labour, etc)
- Aligning external resources/ agencies to meet Reliance's goal of timely & quality completion of projects.

To overcome these challenges, the company assessed by pooling resources and working together as a team that involved the Reliance project construction and procurement group, our sub contractors.

