

## Repsol YPF awarded GE ecomagination Leadership Award for environmental improvement

GE's Dianodic\* Plus contribution to Repsol YPF's environmental impact reduction through effluent reuse in cooling circuits during contingency situations resulted in significant additional operational savings.

### Challenge

Repsol YPF is an integrated international oil and gas company, operating in 30 countries. It is involved in oil and gas downstream and upstream operations, as well as chemical processing and gas and power distribution. It is also one of the ten major private oil companies in the world, the largest private energy company in Latin America in terms of assets, and the leading company in Spain and Argentina.

La Plata Refinery, a processing plant extending along 340 hectares in the interlock among La Plata, Berisso and Ensenada districts in the province of Buenos Aires, is the greatest crude oil processing plant in the country – amounting to 30,000 m<sup>3</sup>/day, i.e. 30% of Argentina's total refining market.

Given its capacity for crude diversity processing throughout Argentina, Refinería La Plata is devoted to refining processes aimed at producing a wide array of products – gasoline, gasoil and aviation fuel for transportation purposes, lube oil, paraffins, petroleum coal, petrochemical gasoline, petrochemical polypropylene, liquefied petroleum gas (LPG) and, asphalts.

By mid 2005, Repsol YPF's La Plata Refinery faced a critical situation. Several challenges regarding its liquid effluents and the absence of a control action plan were increasing costs and, were inconsistent with current regulations.



Therefore, the management of La Plata Refinery decided to invite GE Water & Process Technologies to design a short-term action plan which would prevent liquid effluent discharge from exceeding discharge parameters to the river. Longer term, the plan would need to solve any other problems arising from effluents with these characteristics.

### Solution

GE Water & Process Technologies implemented a three tiered plan which included:

1. Creation of a joint team composed of energy, processes, laboratory and environmental experts from Repsol YPF, local experts and GE international experts.
2. Evaluation – Survey of facilities and operational conditions, recovery of analytical historical information and special analysis of water samples performed by GE Water & Process Technologies' Global Centre for Investigation and Development Excellence at The Woodlands, Texas, USA.

**ecomagination**<sup>SM</sup>  
a GE commitment



Find a contact near you by  
visiting [ge.com/water](http://ge.com/water) or  
e-mailing [custhelp@ge.com](mailto:custhelp@ge.com).

**Global Headquarters**  
Trevose, PA  
+1-215-355-3300

**Americas**  
Watertown, MA  
+1-617-926-2500

**Europe/Middle East/Africa**  
Heverlee, Belgium  
+32-16-40-20-00

**Asia/Pacific**  
Shanghai, China  
+86 (0) 411-8366-6489

©2007, General Electric Company. All rights reserved.

\*Trademark of General Electric Company; may be registered in one or more countries.

CS1253EN Dec-07

3. Statistical data analysis applying Six Sigma methodology for the selection of technologies, process simulation and operative implementation of feasible solutions.

The work carried out along these three guidelines allowed GE to identify the most efficient solution to this problem – effluent reuse as makeup water in the Mayor Conversion cooling circuit, thus avoiding its discharge into the Río de la Plata.

To complete the reuse process, it would also be necessary to replace traditional chemical treatment technology in cooling circuits with GE Water & Process Technologies' Dianodic Plus technology. The system would then be able to tolerate higher contamination levels – C.O.D, ammonia, etc.- while being protected from corrosion, biological fouling and scaling.

This made it possible to create total effluent reuse conditions in contingency situations.

## Results

Thanks to the implementation of the GE Dianodic Plus technology, Repsol YPF attained a 16,000 m<sup>3</sup> decrease of its effluent discharge and makeup water consumption, as well as significant pollutant reduction in liquid effluents and, an overall savings of US\$ 530.000 in operational costs.

In addition, Repsol YPF's implementation of a Comprehensive Management Program comprising effluent chemical treatment processing through PolyFloc and KlarAid technology and, GE Water & Process Technologies' technical maintenance at its La Plata Refinery allowed for water management centralization. This, in turn, stabilized the whole system and eliminated all possible contingencies.

The efficiency and significance of this solution led Repsol YPF to be granted the 2006 ecomagination Leadership Award, a GE Water & Process Technologies reward program which globally recognizes customers with an outstanding performance in environmental conservation.

Within the framework of GE's global ecomagination initiative, this award is granted to those clients who, through their teamwork and innovative solutions, reach environmental objectives such as the reduction of water, energy and emissions, while decreasing the overall cost of its operations. Considering the existence of environmental concerns such as water scarcity, this award emphasizes the positive balance between industrial and environmental challenges.