

# Repsol YPF Refinery Improves Process Control with Profit Controller



Honeywell's Profit® Controller application, with its patented Robust Multivariable Predictive Control Technology (RMPCT), improved the purity of products at the Repsol YPF refinery in Luján de Cuyo, Mendoza, Argentina. Higher quality products have translated into significantly more revenue for Repsol YPF.

## Benefits

Repsol YPF chose Honeywell's Profit Controller to improve process control at its refinery in Luján de Cuyo, Mendoza, Argentina. The controller provided Repsol YPF with these key benefits:

- Reduced propane content in fuel gas by 60 percent
- Decreased butane content in propane stream by 70 percent
- Lowered Reid vapor pressure of naphtha by 35 percent by reducing amount of butane in the naphtha
- Decreased waste due to operative stabilization and specifications control
- Improved recycling of products from the naphtha stripper back to the stripper
- Simplified knowledge transfer as in-house engineers worked with Honeywell technicians throughout implementation of the new controller

- Keep all products under specification
- Minimize giveaway
- Reduce large disturbances in the outgoing stream flows (as they feed downstream petrochemical units)
- Prevent normal process anomalies that are difficult for console operators to anticipate

Operators and plant managers also faced problems with continuously recycling products from the naphtha stripper and primary absorber back to the high-pressure separator (HPS) and down again to the stripper.

## Solution

In 1997, Repsol YPF teamed with Honeywell to reinstrument all refinery units to a distributed control system (DCS). The two companies complemented each other's knowledge areas as they worked together, implementing Honeywell's proprietary Profit Controllers on a third-party DCS.

The controllers were commissioned on the FCC II and the Delayed Coker Unit #2 (Coker II) as they were considered to have the highest potential for economical profit maximization.

As the FCC II and Coker II control systems were built upon ABB's DCS, a custom written program had to be installed for each controller to meet Profit Controller's functional requirements.

Benefits of the reinstrumented FCC II gas plant include:

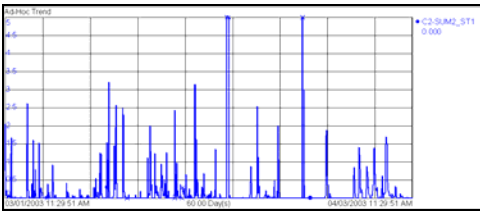
**Reduced amounts of heavy components (C4+) in the propane stream.** Graphs 1 and 2 show trends before and after the controller was put in service.

## Challenge

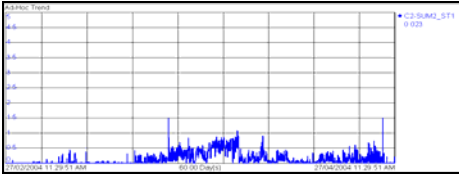
Repsol YPF is a multinational energy and chemical company with a refining capacity of more than 1.2 million barrels per day. Repsol YPF strives to maintain excellence in the quality of its products while keeping its production costs down.

Two previously installed, non-Honeywell multivariable controllers were abandoned and dismantled after a brief service period of four months. This abandonment was due to lack of knowledge transfer and the inability to handle changing conditions.

The Fluid Catalytic Cracking Unit #2 (FCC II) gas plant presented several operative challenges that required permanent supervision to:

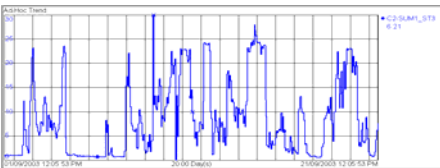


Graph 1: Before: high amounts of butane and other heavy components (C4+) in the propane stream

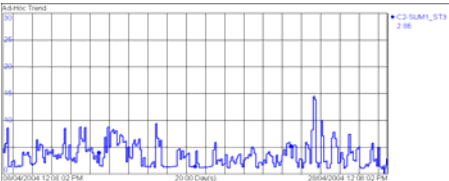


Graph 2: After: C4+ in propane stream significantly lower

**Minimized propane content in the fuel gas stream.** The reduction in propane content resulted from the deft manipulation of absorbent flows, while taking their temperatures into account, as shown in graphs 3 and 4.



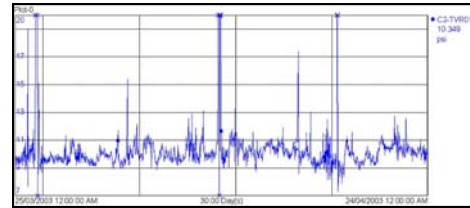
Graph 3: Before: high C3 in fuel gas



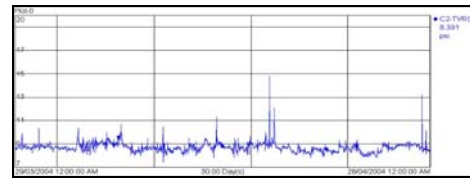
Graph 4: After: C3 in fuel gas significantly reduced

**Improved recycling of products from the naphtha stripper back to the stripper.** A minimum amount of C3 is constantly purged to the fuel gas stream to avoid concentration of light components in the system. This purging has solved the recycle problem. In addition, the controller manipulates gas flow from the stripper, keeping a set temperature inside the vessel which helps ensure correct naphtha stripping.

**Lowered Reid vapor pressure of naphtha and reduced amount of butane in the naphtha.** Naphtha stabilization was achieved by bringing down the Reid vapor pressure, and minimizing the amount of butane in the naphtha.



Graph 5: Before: Reid vapor pressure is high



Graph 6: After: Reid vapor pressure significantly lower

**Summary**

Enhancement in the purity of the products from the refineries was a key outcome of this project. Repsol YPF's Operations department expressed a high degree of satisfaction with the application performance, which has a 98 percent availability.

**For More Information**

To learn more about how Honeywell's Profit Controller, visit [www.honeywell.com/ps](http://www.honeywell.com/ps) or contact your Honeywell account manager.

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