Rockwell Automaton helps BCP de Venezuela with worldwide launch of two innovative intelligent control solutions for oil wells

BCP de Venezuela, also known as BCPVEN, part of the worldwide corporation BCP International, is dedicated to the manufacturing and installation of artificial lift technology systems for the oil industry. It has an installed base of more than 1000 wells and counts Petróleos de Venezuela (PDVSA), SINCOR (TOTAL), REPSOL, and PETROBRAS among its major customers. The company offers two innovative systems, the CILA 2S and the CIMA 2S, which are intelligent control platforms providing greater well reporting capabilities. This allows for higher productivity at lower costs. The company manufactured the products with the support of Rockwell Automation, which supplied the appropriate hardware technology to develop this solution.

Challenges

- Optimization of oil production in real time: lack of real-time data, optimization tools, and real-time control
- Increase in the life expectancy of downhole and surface oil wells
- Deficiencies in the quality of electrical supply. Presence of harmonics (IEEE 519-92)
- Standardization problems: different technologies, difficulties with equipment integration

Solution

- A flexible platform allowing the integration of different methods of artificial lift over a single communication network, thus facilitating the exchange of information through advanced optimization applications
- Integration of PowerFlex 700 Drive, ControlLogix and CompactLogix, PanelView 1000 and 600. Rockwell Automation monitors and USP
- Development of algorithms for control and protection of downhole PCP, BES, and BMC pumps.

Results

- Centralized control and cluster optimization
- Improved system reliability
- Extended in well life
- Increase of operational flexibility and reduction of maintenance costs

Oil well artificial lifting requires, among other options, progressive cavity pumps (PCP), which are widely used in the industry as they offer advantages such as easy of operation and design, low costs, and ease of maintenance and installation as compared to other similar methods.

In order to develop this technological solution, BCPVEN began more than a year ago to develop a system called CILA 2S, which is an intelligent controller especially designed for solutions based on progressive cavity pumps. It combines automation engineering with production optimization of crude oil.

“The pumping system had always been made up of very basic controls,” explains Alexander Mendoza, President of BCP de Venezuela. “But our company began evaluating a series of providers in order to create an innovative application,” he adds.

BCPVEN contacted Rockwell Automation to provide the hardware technology needed to execute this application, which at that time was the first system known as CILA 2S 1G. “We realized that Rockwell Automation was the company that possessed the technology necessary to develop a product that would have automation-related characteristics as well as petroleum engineering”, the executive states.
Continuous operation during power failures. Ensures continuous operation up to 720ms for electric submersible pumping.

Before contracting the services of Rockwell Automation, the company visited several providers to obtain the related technology, but due to the high manufacturing volume, almost none of them had the ability nor the interest to take on this challenge. “Many of them said it was impossible and risky. We were talking about a completely new innovation for this market, which meant a paradigm change and a significant difference in technology,” Mendoza says.

Mendoza states that with Rockwell Automation’s Integrated Architecture, it was 100% feasible to execute these new solutions for the artificial lift market. “CILA 2S was then born as a response to the need of the worldwide market, and we knew that its growth would be significant,” he explains. “Rockwell Automation believed in our vision, and that’s the reason we chose them. Today, history proves us right: production volumes and marketing exceed our requirements,” he explains. “From the first equipment that we manufactured up until now, we have more than 1000 units, all manufactured with the support of Rockwell Automation,” he emphasizes.

Six years after the system was created, the company is now manufacturing the third generation of the product. “The change was also accompanied by the evolution of Rockwell Automation technology, from non-integrated architecture to integrated architecture,” Mendoza explains.

Two years ago another platform called CIMA 2S (built-in drilling cluster or production cluster control), which is an integrated application that brings together all the CILA 2S optimization capabilities under a single macro control. This allows not only optimization of the well, but production supervision as well. In simple terms, this application is able to manage several wells simultaneously, unlike CILA 2S, which can only work on a single unit.

“Within the next 20 or 30 years, a large percentage of oil wells producing heavy crude worldwide will be controlled by this type of technological platform, in which BCPVEN is a pioneer,” Mendoza predicts.

In addition to providing post-sales technical support, Rockwell Automation’s activities are concentrated on providing the basic products that BCPVEN needs to develop these applications: The PowerFlex 700 frequency drive; the ControlLogix control and supervisory platform; the PanelView 600 visualization system; and all Allen-Bradley products.

ControlLogix is used to supervise operations performed by the CILA, while the frequency drive moves the pump at different revolutions to produce oil from the well. PanelView displays the system operation. One of the main challenges for BCPVEN and Rockwell Automation was to convert a product into a standard solution for the oil market.

World-Class Platforms
The built-in artificial lift controller (CILA) designed by BCPVEN was the first tool aimed at managing subsurface and surface variables, while the remaining applications only controlled surface-related aspects.
Improved Reliability and Durability

Today the application is the brains of the oil well, providing greater data reliability and durability of the extraction pumps, and minimizing maintenance shutdowns.

“Traditionally, companies used frequency drives that changed the well speed and, therefore, its production,” Mendoza explains. “Today, our tool is the first solution that provides intelligence to the well, which provides better control, memory logging, and diagnostics. All this translates into substantial benefits when extracting oil: greater operating life of the well and a reduction in production costs.”

Furthermore, the system provides other unique benefits such as information storage, trend graphics, and easy navigation, among others. It’s also a more compact product and offers greater protection as well as color touch-screens.

Given the current success, the company is positioning itself in various markets in Venezuela, Brazil, Colombia, Ecuador, Peru, and is studying the possibility of entering the U.S., Canada, and Trinidad & Tobago. “The most important thing is that all these developments are being carried out with a global provider such as Rockwell Automation, which helps us enormously in our task of offering the solution on a worldwide basis,” Mendoza says. The president of BCPVEN points out that another one of Rockwell Automation’s important competitive advantages is the quality of its technical support. “The help we received at the start of the project was essential. That’s when world-class technical support is needed,” Mendoza emphasizes. “Together with the general manager of Rockwell Automation Venezuela and his staff, we’ve designed a common plan to provide technical support to the company not only locally, but throughout the headquarters as well.”

An additional benefit provided by Rockwell Automation, according to Mendoza, had to do with the ability to adapt its technology solutions to the requirements laid out by the customer over the years. “Rockwell Automation has made it easier for us to do our job and develop new markets,” Mendoza concludes.