

## MOVING IN THE RIGHT DIRECTION

Learn how a natural gas transportation company increased pipeline transport capacity by 9.4 million m<sup>3</sup>/day by installing new control and security systems and communication networks.

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Transportadora Gas del Sur's (TGS) Bajo el Gaulicho gas compression plant is one of 16 compressor plants along TGS's 3,756-km (2,334-mile) General San Martín gas pipeline.

➤➤ The Transportadora Gas del Sur (TGS) gas pipeline system, Buenos Aires, Argentina, needed to build a new installation at its Bajo el Gaulicho gas compression plant. The plant is one of 16 compressor plants along TGS's 3,756 km (2,334 miles) General San Martín gas pipeline. Rockwell Automation Solution Provider ElectroDinámica SA (Eledisa), Neuquén, Argentina, was asked to assist TGS integrate the network and control system for the new installation.

The pipeline has a 40 million m<sup>3</sup> nominal flow volume of natural gas per day at 60 bars of pressure. It runs from southern Argentina to the major consumption centers in the province of Buenos Aires. In addition, a Bajo el Gaulicho compression plant is located in the Chubut province of Argentina, 90 km (56 miles) north of the city Puerto Madryn, and processes 10 million m<sup>3</sup> of natural gas per day.

The project objective was to increase the transport capacity of the pipeline

by 9.4 million m<sup>3</sup>/day. To achieve this, a new pipeline was installed to run parallel to the old pipeline between compression plants. Also, a new compressor plant was built next to old Bajo el Gaulicho compressor plant, with both plants having the ability to control both pipelines.

### The Production Process

The plant's production process begins with entry valves that allow plant operators to choose which plant will control which pipeline. To guarantee the quality of the gas before it's compressed, the gas is passed through a separation and filtration stage to separate the gas from liquid or particulate matter.

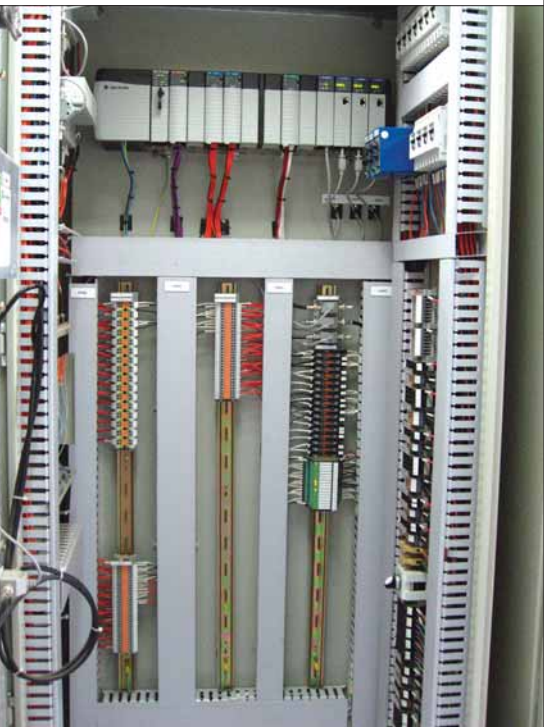
Next is a compression stage in which a centrifuge compressor driven by an industrial gas turbine compresses the gas. Then the gas is measured to determine and document the quantity of gas transported.

The final stage is the use of exit valves that allow the plant operators to choose which gas pipeline they would like each plant to use. Several auxiliary services that are part of the entire production process at the plant include electricity generation used at the plant, air compression for instruments, adjustment and regulation of

combustible gas for the generators and turbines, and other needed services.

## How the Project Was Organized

Eledisa designed, built, installed and provided the start-up services of the control system, security system, supervision system and communication networks for the new plant. Working as a subcontractor for Constructora Norberto Odebrecht, Eledisa coordinated the project from its business center in Buenos Aires and built and tested the control systems in its industrial workshop at its headquarters in Neuquén. The project spanned five months and required approximately 4,000 labor hours.



Rockwell Automation Solution Provider Eledisa implemented a control system based on the Logix Controller Family technology and distributed, remote Flex I/O modules connected to the main control system via a ControlNet network. The system uses Allen-Bradley CompactLogix, ControlLogix and GuardLogix controllers.

## >> About Eledisa

Electrodinámica SA (Eledisa), Neuquén, Argentina, is a Rockwell Automation Solution Provider that acts as a local contact, providing engineering and start-up services to systems integrators and OEMs in North America that have clients in South America.

The project was divided into three main phases: engineering, construction and commissioning and start-up. During the first phase of the project, Eledisa completed the detailed engineering, hardware and software engineering, and control logic for:

- Four security and regulatory systems (three controllers and two remote chassis).
- Two communication control systems.
- One supervision system (two stations in Hot-Standby and one remote system).

They built the panels and configured the systems in their Neuquén, Argentina industrial workshop. Eledisa installed the systems at the plant and connected them to instruments in the field to supervise and control the industrial process. Finally, they commissioned and provided start-up services for the systems.

## Technology Used for the System

During the project's final stage, Eledisa encountered a compatibility problem with the communication of the soft starters. The basic engineering provided by the client should have taken the data from the soft starters toward the control system by a series link using the remote terminal unit (RTU) Modbus protocol, but the soft starters installed in the plant were equipped with the DeviceNet protocol.

To overcome this problem, Eledisa changed the modules for others that supported the Modbus RTU protocol.

This option was possible thanks to the numerous communication modules that are available through Rockwell Automation for the integration of their soft starters to the different communication architectures.

Eledisa selected Rockwell Automation as the core platform for this solution because of its proven track record with previous projects involving TDS and Eledisa with similar applications. The Solution Provider used one each of Allen-Bradley® CompactLogix®, ControlLogix® and GuardLogix™ controllers from Rockwell Automation.

With network standards ControlNet and DeviceNet, Eledisa implemented a control system based on the Logix Controller Family technology and distributed, remote Flex™ I/O inputs that were connected to the main control system via a ControlNet network. The capacity of this system was 300 I/O.

Eledisa also implemented a security system based in GuardLogix with distributed I/O inputs connected to the central control system via a DeviceNet network. The security system's capacity was 150 I/O.

The Solution Provider relied on the technical support of Rockwell Automation engineers for part of this project. This was the first time Eledisa worked with GuardLogix controllers, so the company worked with Rockwell Automation engineers, who provided technical support for the configuration of the controller.

Many features of the Rockwell Automation solution allowed for successful results, including the reliability of the

communication protocols, ControlNet and DeviceNet; the use of certified controllers SIL 2 and SIL 3 to increase the plant's security system reliability; and the ease of integration with other machines and systems at the plant.

## Results

As a direct result of this project, the client achieved its overall objective of increasing its ability to transport gas by 9.4 million m<sup>3</sup>/day, and realized numerous other benefits.

With a new detailed supervisory system, the plant's operation reliability improved. The client now has a constant validation of the operator's actions, which it didn't have before. Also, maintenance time decreased with the unification and simplicity of the Rockwell Software RSLogix™ 5000 configuration software from Rockwell Automation.

In addition, now that the control systems for the plant and the turbo-compressors are based in the same Logix Controller Family, the client has simplified employee training and reduced the training time required.

The project was a true collaboration between Eledisa and Rockwell Automation Argentina and included Gustavo Campetella, vice president



At the Bajo el Gaulicho gas compression plant, the wastewater treatment skid is where all of the impurities that enter the plant — primarily water and oil — are separated from the gas. The majority of the impurities are filtered in the entry separators, but others come from the turbocompression lubrication circuit.

and lead engineer; Alejandro Cortez, engineering coordinator; and Alvaro Iglesias and Carlos Bree, engineers from Eledisa. From the Rockwell Automation Buenos Aires office, Luciano Marrazzo, engineer, was on the team and Sergio DeVita, sales engineer from the Rockwell Automation Neuquén office, also worked on this project.

With the combination of excellent

products, support and a team effort from Eledisa, Rockwell Automation Argentina and the client, this project was a success. Eledisa plans to implement more Rockwell Automation solutions for this project. The client anticipates expanding in the next two years, and Rockwell Automation products are the only products the client is considering. □

*Electrodinámica SA (Eledisa) is a Rockwell Automation Solution Provider based in Neuquén, Argentina, with offices in Buenos Aires, Comodoro Rivadavia and in Santa Cruz de la Sierra, Bolivia. Eledisa serves the oil and gas, water wastewater, food and beverage, consumer products and other markets.*

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