



Cathodic protected gas pipelines in Algeria using Movicon

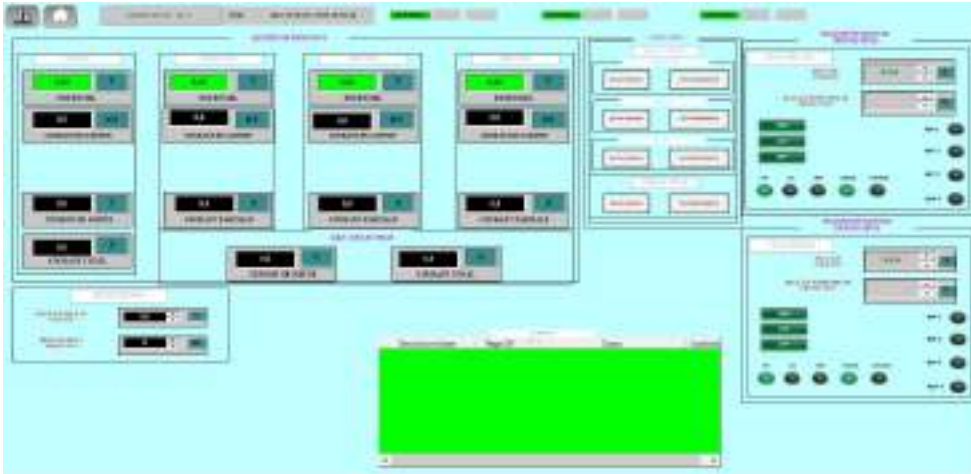
En-Cube has created a supervision system for monitoring gas pipeline conditions in Algeria.

En-cube S.r.l. is a single shareholder company from Palermo who have been operating in the field of automation and process control, software engineering, artificial vision, HMI interface programming, PLC, mechatronics and SCADA systems nationally and internationally since 2009. The team is composed of young Sicilian engineers led by a Project Manager who are committed to realizing the specific contract goals. The client of this specific contract is Saipem S.p.A. a joint-stock Italian drilling and construction company who are also a subsidiary of ENI S.p.A. Saipem is a world leading company in Engineering & Construction, drilling and oil & gas operating as a provision service in the oil sector. It specializes in realizing infrastructures which concern the exploration of hydrocarbons, drilling and setting oil wells into operation as well as oil and gas pipeline construction. The company has assigned En-Cube on a contract to develop and engineer a supervision system that can constantly

monitor the status of the gas pipelines of the GK3-Lot 3 gas transportation system in Algeria. This 48 inch pipeline system will extend from the town of Mechtatine to Tamoulouka in the northwest of the country. It will then carry on northwest for 350 km towards the towns of Skikda and Elkala on the Algerian coast.

System Description

The client specifically asked En-Cube to implement gas pipe wear and tear verification using cathodic protection rectifiers. This is an electrochemical technique that is deployed to protect metal structures exposed to electrolytic environments, such as those containing land, seawater, fresh water or aggressive chemical substances, from corrosion. To satisfy Saipem's request, En-Cube design engineered a supervision system with the latest Movicon 11.4 version by deploying a 'Parent-Child' architecture where the Parent



2. Scheme of the supervision system relating to the parameters gathered from the various control stations.

direct link between screens, objects and properties can be implemented.

The use of graphs, curves and trends allows the technicians to display and view voltage and frequency values that have been gathered from RMUs residing in different pipeline sections. These values are recorded in a

project contains all the resources of several Child projects. Two redundancy licenses were installed on two Servers located in the main control station and the pipeline terminal. In addition eight Client licenses were installed on laptops used by system management personnel.

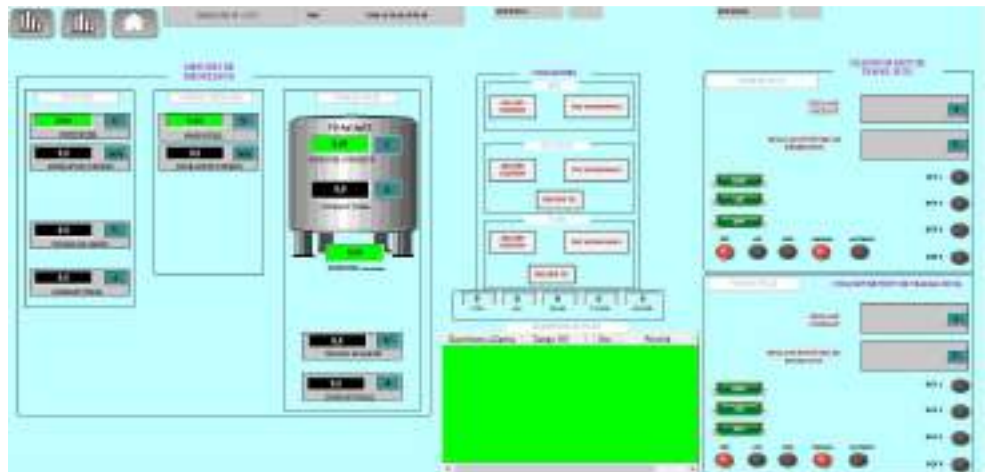
The process data are gathered in a database using several resources such as: Basic scripts and Data Loggers. The historicals are managed with event and screen parameterization resources. The project contains screens that have identical graphics but which are associated to different variables. By means of using public symbols the same properties can be set automatically for all those symbols which have been linked to each other by using a reference symbol.

This system is most appropriate for structured and modular project distribution where a

relational database and displayed in real-time-time in order to monitor the status of the tube lining through which the gas flows. The screens have been purposely designed with commands that can be sent to the control stations, by using GPS, to collect and synchronize data. Subsequently data is collected from the RMUs in order to increase or decrease the voltage and transformer current values in the control stations.

The SCADA and the 54 RMUs communicate using the "Modbus Tcp/IP" protocol. One RMU per control station has been installed along the three sections that together total 350 km long pipeline. The ad-hoc RMUs were built especially for the application and are not available on the market.

En-Cube's Administrator Engineer Roberto Morgana confirmed that: "The simplicity-of-use and intuitiveness make the Movicon SCADA complete and reliable to use for the



1. How graphics are displayed in one of the screens

smallest to the most complex application”.

Eng. Roberto Morgana

Eng. Luigi Calì

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