The Rain in Spain Falls Mainly on Barcelona

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The CLABSA Problem

Drainage of rainwater and wastewater has always been a problem in Barcelona, Spain's largest commercial metropolis. CLABSA is the Sewerage Mixed Company of Barcelona, dealing with this problem that has become especially critical because of the city's recent phenomenal growth. The company's three major tasks are: to dispose of rain and sewerage to protect public health, to protect property flooding and to reduce environmental pollution from sewer overflows.

These tasks are executed by carrying out the following basic activities:

- Create a database for real-time access of any information related to weather conditions: rainfall, levels and flow; water quality; sewer network conditions, etc.
- Perform weather rainfall forecast and determine emergency levels for the proper management of the sewerage system
- Flood control provisions – to reduce possible damage due to flooding
- Reduce and control combined sewer overflows resulting from heavy rainfall
- Global strategies to determine optimal operation
- Remote control of sewerage system regulators
- Store and allocate data from the central computer to peripheral computer systems to optimize their operation

The Solution

To perform these tasks, CLABSA employed ADASA SISTEMAS to design a state-of-the-art SCADA system. ADASA won a competitive tender for the design and execution of a real-time control system with the following capabilities:

- Simulation operation and diagnosis of Barcelona's sewer network
- Analysis for future action and strategic technical planning
- Control, recommendation and planning of future work in the sewer network
- Geographical Information System (GIS) of the sewer network
- Real-time control of sewer system
- Dynamic technical operation
- Drainage system development for Barcelona and surrounding urban areas
- Expand advanced technical management to other cities
- Administrative and financial management of the entire system

After getting approval of the design, based on Motorola MOSCAD RTUs and the MDLC Gateway for TCP/IP, ADASA engineers commissioned the system. They programmed and installed approximately 40 MOSCAD RTUs, installed a SCADA software package and set up the communications system for remote control and data transmission. The system today controls from the control center: rainfall and water level meters, pump stations, water gates and water quality stations and has the capability of adding many more components in the field.

Historical field data is recorded by the MOSCAD RTUs and then transmitted by PSTN and dedicated lines and radio to the CLABSA control center for processing and analys. The control center is based on the Supervisor SCADA package from Compax, running on a DEC Alpha server. Application operation is performed on the Compax Supervisor System. Data is automatically transferred to an Oracle database which enables communication with other urban services and utilities.

MDLC Gateway for TCP/IP

A Motorola MDLC Gateway for TCP/IP, was installed to open the SCADA system to a multivendor environment. Field data from the remote MOSCAD RTU stations is transmitted reliably and cleanly, regardless of the transmission medium, into the
TCP/IP environment at CLABSA' s control center. The Gateway manages the seamless routing of data between two network environments. ADASA recognized the advantage of Motorola's approach in providing a Gateway that allows such easy integration into third party software and network systems.

The new system has already been of benefit to the city of Barcelona, by:

- Reducing risk of flooding – equipment and sewer network are used more efficiently
- Warning the public, in time, of potential flooding
- Increasing sewer network efficiency and reducing maintenance costs
- Improving control of quality of waste and rain-water discharge to the sewer system and to sewer overflows reducing pollution impact on the Mediterranean Sea and Besos River
- Providing Barcelona City Council with improved data on sewer behavior to reduce the amount of investments still required for the network

Motorola's MDLC – a gateway to a cleaner and healthier city.