

EPAL - Lisbon's Water Supply

Real-time control and data acquisition bring utility into 21st Century



The 18th-century Águas Livres ("Free Water") aqueduct, Lisbon

EPAL (Empresa Portuguesa de Águas Livres), the successor to the Lisbon Water Supply Company, has been responsible for supplying water to the Portuguese capital since 1868. With over 150 years of experience in delivering this essential service, EPAL has the most important water production and distribution infrastructure in Portugal.

EPAL's daily production is sold directly to approximately 345,000 domestic consumers throughout Lisbon and indirectly, through municipal services and distributors, to 26 neighboring municipalities. The total population serviced exceeds 2.6 million inhabitants across an area of 5,406 square kilometers.

It manages three sub-systems with the following production capacities:

- Water spring of 70,000 m³/day
- Underground catchments of 270,000 m³/day

- Surface catchments of 740,000 m³/day

After restructuring its operations to include new PLCs at each station as well as new sensors and final command systems, EPAL created two major business areas that divided the existing command center in two. The first would be concerned with water production, transportation and distribution to the municipalities north of Lisbon, while the other would manage the direct water distribution to consumers in Lisbon.

The Challenge

The old EPAL telemanagement system ran on DEC ALFA AXP computers. Reports were processed on a single computer. Generally, the old system showed slow response times and was limited in terms of expansion. The development project required:

- Redundancy in the system's main services: communications, alarms, trends and reports and all the supervisory system's services



The Challenge

Separate EPAL's existing command center into two separate entities while ensuring the compatible integration of all PLCs. In addition, the new SCADA system would need to ensure redundancy throughout the systems and display refresh times of less than three seconds.

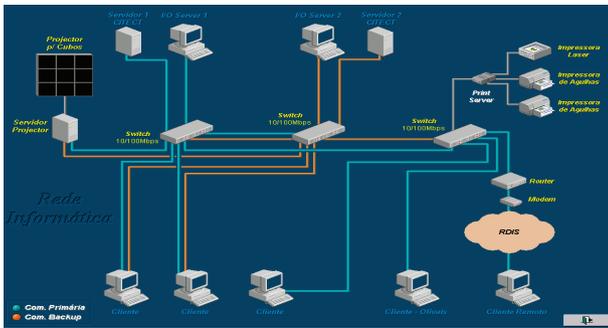
The Solution

An integrated solution for the two new command centers based on CitectSCADA, with Microsoft Windows NT providing the operating system.

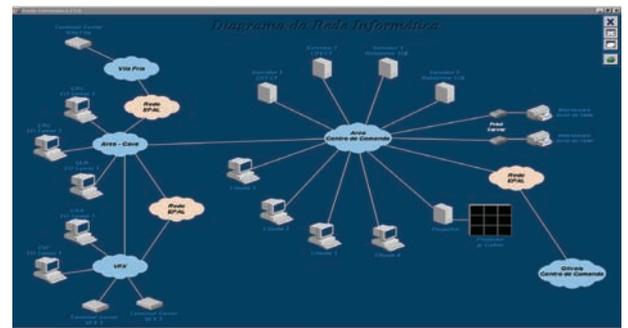
The Benefits

EPAL gained real-time control over the whole network in its two new command centers. Overall, EPAL has lowered its total cost of ownership by implementing built-in redundancy and retaining its existing hardware investment.

Solution increases reliability and lowers TCO



System network at first command center



System network at second command center

- Compatibility with the existing field PLCs
- Integration with all PLCs via fiber optic network
- Ability to keep the existing graphic interface structure and integrate new functionalities at the command center level
- Guarantee of display refresh times of less than three seconds
- Integration of existing projection systems
- Interconnection of the two command centers

The Solution

EPAL chose CitectSCADA software via a valued local integration partner for the application integration because they offered the optimal solution, both technically and economically.

CitectSCADA provides a proven network architecture and built-in redundancy, combined with the ability to meet all of the customer's requirements in terms of alarms, trends, reports, language, calculations, commands and response times.

The solution was based on CitectSCADA, with a Microsoft Windows NT operating system. CitectSCADA met all the project's special requirements including:

- Service distribution through several servers
- Redundancy for all communication services, alarms and trends
- A communication capacity higher than 16 RS- 232 ports, with redundancy for each piece of communication equipment
- Communications protocol compatible with existing PLCs
- Excellent graphic capacities
- Displays with automatic adjustment when re-dimensioned to allow various displays on the same screen
- Ability for various technicians to work simultaneously on a project
- Scalability that allows the system to be expanded to incorporate other servers and clients
- Access via Internet

Due to the short development time frame, the team relied heavily on CitectSCADA's attributes to complete the project on time. CitectSCADA allows various technicians to work simultaneously on the same project, as well as enabling them to re-utilize resources like animated objects (genies and super-genies) and templates.

CitectSCADA's use of the redundant I/O servers assured communications' functionality and reliability. If the primary I/O server stops working, the redundant I/O server automatically initiates the communications management of all field equipment. It is also possible to divide the system load between the two I/O servers.

Each center has two redundant servers to process trends and alarms, as well. If one server fails, the second server takes over the alarm or data processing. When the faulty server returns online, the information that was collected while it was offline is automatically backfilled. This way both servers are always synchronized.

The Benefits

With CitectSCADA, EPAL achieved its goal of real-time control over the whole network in its two new command centers. It now has a reliable solution that lowers life-cycle costs through improved operator efficiency and easy maintenance. Business decisions regarding delivery, treatment and distribution have been improved through the availability of enhanced data for process evaluation. Overall, EPAL has lowered its total cost of ownership and ensured the steady supply of precious water to the residents of Lisbon and its surrounds for years to come.

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