PROFILE
- Subject : SCADA
- Process :
  Green consumption
- Client : SNCF
- Date : 2011
- Installed base :

Panorama E²

Panorama IT

Fibre optic loop

Modbus TCP/IP Protocol
for Schneider controllers
BACNET Protocol for
Kieback & Peter control-
lers

Modbus RTU Protocol
for SOFREL telemetry
local users

Panorama E2

SNCF National green consumption project

Renovation of Corail railcars in
the SNCF technocenter in Saintes,
monitored by Panorama

AIMS
Deploy an automatic
telemetering system for
water, gas, and electricity.

Identify the types of
consumption by separating
"process-based" consump-
tion from consumption
related to building opera-
tions.

BENEFITS
Control of energy
consumption.

Return on investment !

The SNCF Equipment Department has initiated a nationwide "Green Consumption" project designed to read the detailed consumption of energy-guzzling facilities within each technocenter.

The SNCF Charentes Périgord technocenter in Saintes (in the Charente-Maritime region of France) set up a Panorama E² SCADA system in 2011 to manage BMS, Facilities Management, and the center's processes. It also uses Panorama IT to generate reports and to analyze consumption.

The SNCF Charentes Périgord technocenter in Saintes (in the Charente-Maritime region of France) is responsible for maintaining Corail railcars. The cars are completely renovated; only the chassis is retained. The various parts are subject to different process steps, including a grit blasting tunnel where steel balls are shot against a metal surface using compressed air; a lime softening process where parts are conveyed to the paint shop and then to the oven for baking; a sanding tunnel, a tag removal area; etc. The parts come out like new, and the re-assembled cars are ready to roll.

The project started in 2009 when the Equipment Department at SNCF headquarters requested 16 of the 38 technocenters to implement a nationwide Green Consumption project. Each unit was given a budget in order to acquire solutions suitable for the control of energy consumption.

Objectives
The Asset Procurement Department in the Charentes Périgord tech-

CODRA

Panorama view:
Metering consumption at the SNCF
Technocenter in Saintes

nocenter in Saintes is responsible for an automatic telemetering system for water, gas, and electricity. The aims of the system are to :

• read the consumption of all the facilities,
• identify the types of consumption by separating "process-based" consumption from consumption related to building operations (heating, toilets, etc.).

A "technical" network was set up for IT security reasons in order to protect the corporate network. The Asset Procurement Department, in accordance with the SNCF Regional Telecoms and IT Office, developed its own IT network for the Green Consumption project.

The organization decided against the "turn-key" solutions on the market as they were not open-ended. These "proprietary" solutions are either difficult or impossible to modify. The technical team sought standard equipment which was both configurable by the Technocenter staff and widely used in the industrial telemetry field.

After comparing the products available on the market, the Asset Procurement Department chose the Panorama E² solution.

Why Panorama ?

The Asset Procurement Department at the SNCF Charentes Périgord technocenter in Saintes decided to do without integrators in order to fully control the entire project. "We decided to work with Codra due to the easy learning curve of Panorama E², the object-oriented technology, and the application's evolution in terms of both variables and specific requirements," said Jean-Luc PLISSONNEAU, Operations Manager – Investments – New Projects in SNCF Saintes. Panorama E²'s 100% object-oriented programming simplifies development and maintenance, and encourages the re-use of components both within the application as well as at other sites.

Codra, a French company founded 26 years ago, is a key player in SCADA solutions. "The quality of our relations with the Codra team, the training facility nearby and the easy access to their technical support are key advantages," said Jean-Luc PLISSONNEAU.

The plethora of protocols supported by Panorama E² encourages operators to diversify or to adopt new technologies. The system architecture is based on Schneider controllers communicating via Modbus TCP/IP. SNCF later added Kieback & Peter controllers using the BACnet protocol.

The graphical quality of Panorama E² enabled SNCF to import 3-D views in order to improve navigation within the SCADA system; this simplifies the job of many operators.

The project

The Charentes Périgord technocenter in Saintes includes 27 buildings spread across 14 hectares (36 acres). Initial development focused on Building 31.

The solution handles many requirements :

• A highly visual typographical configuration,
• Custom deployment which can be changed at any time,
• Fully configurable data recovery,
• Configurable alarms with alerts,
• Continuous, total control of the network equipment.

Asset procurement department personnel receive training on Panorama E² and Panorama IT, as well as five days of support. This traditional project supervision model is ideal and — without surprises — operators quickly became totally autonomous regarding this ready-to-use custom application. Furthermore, functional objects created by Panorama can be re-used, enabling the application to change over time and to manage an unlimited number of variables. It can be adapted to other SNCF technocenters. The SCADA solution provides the Asset Procurement Department team with an overview of the entire project. "The application gives us peace of mind: we know where we're going. Reports display concrete information, and management trusts us. Now they must apply an effective energy strategy," said Jean-Luc PLISSONNEAU.

A better management.

The Asset Procurement Department has already benefited from management decisions. "Before the arrival of the SCADA solution, we had a very convoluted view of our actual energy consumption. The only way to quickly observe a problem was to set up an empirical observation system. Today we can continuously view a display that automatically provides the history of any questionable value range, so we can highlight variances and malfunctions."

"For instance, we noticed that peak winter consumption on our EDF electricity contracts totaled 1,250 kw/h, while our subscription was for 3,000 kw/h. We modified our subscription — and thereby saved €80,000! We have three more contracts to modify at their renewal date (Winter/ Summer, Off-peak hours/ Peak hours)," said Didier GINGUENAUD, IT Assistant Correspondent at SNCF Saintes. The same procedure will apply to the Water and Gas contracts.

No savings are too small to ignore. In the air production unit, three compressors run according to demand, each consuming 85kw/h. "By setting up an air distribution schedule based on the flow rate/volume ratio, we have saved another €3,000/year," said Didier GINGUENAUD.

There are numerous examples. The ROI will be fast, as the overall budget for the initial phase amounts to €150k.

Changing behavior.

This project also led SNCF to think about changing behavior, and even the quality process. The project's first step began with remote control and monitoring of the lighting in Building 31. "Before the project, the lights in this building were on continuously from 6 am to 6 pm, representing 294 kwh every day. Each morning all the doors were opened for the railcars to enter, even when certain tracks were not used. Boilers were running when they weren't needed. The history provided by the SCADA system brought these examples of wasted energy to our attention," said Didier GINGUENAUD. "Now all lights are turned off between noon and 1 pm. We can program them to turn off automatically at 6 pm, or the shop supervisor can turn them off manually at 5:45 pm — the workshop always has priority. We can also decide to automatically send a fax to the workshop supervisor whenever the standard rules are not followed, saying 'Caution: your workshop consumed X additional kwh'."

"At this stage of the project we have enough features, measurements, and log data to start drastic, highly-effective monitoring. The tool is available; it can be used to implement an action plan.

At the same time, we can continue development to make improvements on the fringes of the project, and expand its counting or telemetry capacities. The more we use the solution, the more we save".

Managing problems.

The SCADA solution improves everyone's working conditions and significantly reduces the accident rate. If a problem occurs with a pro-

> SNCF has achieved its objective:
> to obtain an open, modifiable, and expandable SCADA solution.

Importing 3-D views
to improve operator navigation

CODRA

Lime softening process:
Fast intervention is now possible thanks to the SCADA system.

cess, for example, the monitoring system directly notifies the Maintenance Team for quick action. "We have been able to even intervene before the situation deteriorates," said Jean-Luc PLISSON-NEAU. "On the lime softening process, we noticed that the painted parts were not coming out of the oven after 15 minutes. We were able to intervene to prevent the paint from overheating. Previously we would have had to search around in the field in order to find the source of the problem".

New developments

New facilities have been added to the SCADA system specifications, based on an environmental approach. In 2012, a purification station was set up in order to handle industrial wastewater and process its chemical products. A drip system was installed to water a vegetation barrier created to hide the industrial site from the neighbors' view; the system manages a set of hydroelectric probes and solenoid valves.

There are plans to create new production lines, new processes, video surveillance of the entrance gate, etc. Thousands of variables will be added to the application. SNCF has achieved its objective: to obtain an open, modifiable, and expandable SCADA solution.

As the sites of Saintes and Périgueux are now working together more closely, and SNCF has decided to install Panorama to replace the current system at the Périgueux center in order to standardize the solution. Shared testing and experimentation will improve the system and help in-house developers.

KEY FIGURES

- Number of on-site employees : 430
- Number of railcars retro-fitted/year:
  about 100
- Number of BMS/FM systems: 27
- Surface area:
  14 hectares - 35 acres (including 4 covered areas)
- Gas meters: 28
- Water meters: 29
- Measurement devices: 80
- Measurement coils: 240 (to collect electrical values)
- Schneider programmable controllers: 13
- Length of the fibre optic loop: 2 km
- Wastewater back-off pumps: 16
- Boiler rooms: 8
- Outdoor lighting zones: 12

From industrial SCADA to a global information system

Panorama E2

CODRA

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