



SUCCESS STORY

PROFILE

- Subject : SCADA
- Process : Champagne Production
- Client : Nicolas Feuillatte
- Date : 2008
- Installed base :
 - Panorama P²
 - 10 000 I/O
 - 13 ABB robots
 - Communications via Ethernet co-processors
 - Security controllers : Siemens
 - Process controllers : Schneider
 - I/O controllers : Wago
 - Modbus communication with the measurement equipment

Nicolas Feuillatte from the vine to sparkling glass



21 million bottles produced/year

AIMS

Public Limited Company with its own wastewater purification plant.

Expand production of the Nicolas Feuillatte brand.

BENEFITS

Control of energy consumption : electricity, water & gas.

Partnership with Industrial / University / Supplier.

For nearly 10 years, the Nicolas Feuillatte Champagne Production Center in Epernay (France) and Codra have partnered to improve the productivity of champagne production. The Panorama P² Supervisory Control and Data Acquisition (SCADA) system was selected to manage, supervise, and provide real-time control of the facilities at the Nicolas Feuillatte site.

The Nicolas Feuillatte Champagne Production Center, created in 1972, is a cooperative of some 5,000 winegrowers. As France's leading cooperative and the fourth-largest worldwide, it stands out as one of the major international financial groups. The Production Center has 200 employees, and half of them work to produce champagne. The Feuillatte

company has obtained ISO 9001 certification for environmental management, and ISO 22000 certification for food safety.

Project history

The Nicolas Feuillatte Champagne Production Center is one of the most extensively automated enterprises in its category. The automation project began in 1997 with the installation of the first pro-

grammable robots and PLCs on the site. In 1999 the Production Center created a team of technical specialists to develop a deployment strategy and to standardize the site equipment. The goal was to expand production of the Nicolas Feuillatte brand from 5 to 9 million bottles per year. An annual budget of €150,000 was provided in order to replace obsolete



Bottle preparation and packaging : 9,000 bottles/hour

equipment and machinery.

In 2000, the Nicolas Feuillatte Champagne Production Center decided to set up its own wastewater purification plant in order to reprocess 100% of the water used - 23,000 m³/year - before releasing it to the ground water. The cooperative's goal is to use as little water as possible and thus become a corporate citizen. The cooperative chose Panorama to supervise the wastewater purification at the plant.

In 2001 a second deployment phase was initiated to supervise the temperature controllers for the first modules in the fermentation cellar. The project was developed in partnership with the Industrial Electrical Engineering Department at the University

of Reims.

The project ramped up during 2004 as the Champagne Production Center expanded the team, adding an operator dedicated to SCADA. The multifunctional Panorama solution was installed to control the various equipment on the site:

- Air conditioning for areas open to the public,
- Control of electrical usage,
- Monitoring of wine cellar temperatures,
- Water consumption,
- Control of automated gyropalettes,
- Drawing off,
- Palettization ...

Process & SCADA

The harvest season

In order to produce either the traditional Nicolas Feuillatte range, grands crus vintages such as the «Cuvée 225», or the new «Palme d'Or» range, the cooperative's wine-growers select their best grapes.

After pressing, they take the grape juice, called the must - a total of about 300,000 hl - to the wine-making center.

Fermentation

The fermentation process can now begin. Selected fermenting agents are added to the must to trigger initial fermentation, which lasts about 7-10 days. These agents transform the sugar in the grapes into alcohol, while releasing carbon dioxide. The vats, with a total capacity of 295,000 hl, are kept at 16°C and the temperature is permanently controlled by the Panorama SCADA software. "Heating or cooling the mixture by just one degree Celsius is carried out very slowly, for this process is vital to ensure top-quality production. It is most important to be able to regulate the temperature reliably and accurately," said Philippe MASSART, technical manager at Nicolas Feuillatte. An expansion project between 2005 and 2007 added 30,000 hl of production capacity (+10%). There is

also a mini-fermentation cellar which performs micro-vinification: oenologists can develop their art using traditional methods and create exceptional cuvées, or batches.

Assemblage

For a month or so, some 400 clear wines are individually analyzed, discussed, and critiqued, using 12 samples per session. Sessions allow the aromatic and organoleptic characteristics of each wine to be defined. This process determines the assemblages or blending of each cuvée.

Bottle fermentation

Once the assembly for each cuvée has been determined, a second alcoholic fermentation process

takes place inside the bottle. It blends both liqueur and fermenting agents into the assemblage wine during the drawing-off process in order to make a sparkling wine: this is the characteristic of the traditional méthode champenoise.

The drawing off line, controlled by Panorama, fills 20,000 bottles/hour. These bottles are moved directly to the cellar to age from 2 to 8 years, according to the cuvée. The minimum period to comply with appellation d'origine contrôlée requirements is 15 months. Sixty-five million bottles are stored in the cellars of

the winemaking center; bottle fermentation begins after just a few weeks.

Riddling

After being aged for the required time in the cellars, sediment and yeast deposits are gradually and

delicately separated from the wine: this is called riddling. This operation involves moving the sediments down to the bottle-neck by rotating the bottles and lifting them to a vertical position. Thus 480 automated gyropalettes riddle some 480,000 bottles each week. For now, only one series is supervised by Panorama, representing 60 cages and 504 bottles. Eventually a total of 8 series will be supervised.

Disgorgement

To permanently remove sediment, the neck of the bottle is placed in an icy glycol solution at a temperature approaching -30°C. The cork (or cap)

is removed from the bottle, and the 6 kg pressure built up during bottle fermentation causes the frozen plug of sediment to pop out. This disgorgement phase is carried out at a pace of 10,000 bottles/hour.

Dosage

The slight loss of wine is replaced by the bottling dosage, developed by Nicolas Feuillatte, a liqueur with a sugar content which produces various categories of champagnes. For instance, a dry Brut champagne will contain less than 15g of liqueur per litre, while a Demi-Sec will contain 35g/litre.

Packaging

The completed bottle is cleaned, dried, and returned to the cellar for at least 2 to 3 months to ensure an ideal mixture of liqueur and wine. Three automated machines package 9,000 bottles/

KEY FIGURES

- No. 1 in France
- No. 4 worldwide
- 5,000 winemakers in the cooperative
- 200 employees
- 21 million bottles produced/year
- 10 million bottles sold/year
- Fermentation cellar capacity: 295,000 hl
- Drawing off line capacity: 20,000 bottles/hour
- Storage capacity: 65 million bottles
- 480 automated gyropalettes
- wastewater purification : 23 000m³/year



480 automated gyropalettes riddle 480,000 bottles/week



Collect must & water purification plant

hour for shipping and marketing worldwide. A large portion of the champagne production at Nicolas Feuillatte is automated and this process is controlled and supervised by the Panorama SCADA system.

Customer feedback

"We chose Panorama because we wanted to work hand-in-hand with a French company. Direct access to technical support was vital, having competent technicians able to answer our

questions," said Philippe MASSART. "We were also very appreciative of the partnership method used. Nicolas Feuillatte, the Reims University staff, and Codra worked together in order to save both time and reduce costs on the project," he said. Codra was also chosen for its prestigious list of references.

Thanks to the Panorama data collection and archiving functions, the cooperative has been able to analyze the benefits of

using the program. "We have obtained significant savings since we installed Panorama. Our consumption of electricity, gas, and water has dropped considerably. For example, both the control and monitoring of boilers have cut our gas bill by 15%," said Frédéric LOPEZ, a former student at Reims University hired by Nicolas Feuillatte as a dedicated SCADA operator.

The SCADA project is still being deployed as now the technical department wishes to take full advantage of all Panorama features. The next steps will focus on the drawing off process in order to analyze down time, availability, and the equipment usage rate (OEE - Overall Equipment Effectiveness). As for the site itself, a two-level open-air cellar is currently being dug into the clay with a capacity of 20 million additional bottles.

A sure sign of more bubbly to come!

From industrial SCADA to a global information system

