Panorama E2

SUCCESS STORY

Andra, underground research laboratory

PROFILE

- Subject : SCADA
- Process : BMS – FM
- Client : Andra
- Integrator : Electro Industrie
- Date : 2012
- Installed base :
  - Panorama E²
  - 2 redundant servers
  - 3 thick clients
  - Panorama IT
  - 10 thin clients : remote systems
  - 4000 variables
  - Schneider TSX premium controller
  - Modbus TCP protocol
  - Sauter controllers
  - BACnet protocol

Tunnels : Study of the argillaceous layer, along with development of engineering, digging, and support techniques.

AIMS

Acquire a reliable tool to meet the site's requirements.

BMS / FM and Safety supervision.

Object technology.

Maintainability and stability.

Extensible to enable future enhancements.

BENEFITS

Simplified extensions to the application.

Reliable system for a critical site.

The Andra underground laboratory is located in Bure, on the border between the Meuse and Haute-Marne regions in eastern France. Its mission is to study and design a reversible deep underground storage facility for highly and moderately radioactive waste from France and with a long half-life. Since 2007 the Panorama SCADA solution from Codra is used at the laboratory's command and control station to remotely manage and maintain the BMS / FM at the site, which has over 1,300 m of tunnels.

Andra (the French National Agency for Radioactive Waste Management) is responsible for the long-term management of radioactive waste produced in France. As part of that mission, Andra provides its expertise and know-how to the French government in order to seek, implement, and guarantee safe management solutions for all French radioactive waste. Andra is an industrial and commercial public entity (EPIC), which is independent of the producers of radioactive waste. It is overseen by the French ministries of Energy, Research, and the Environment.

Feasibility study for the Cigéo project

Andra is located on the border between the Meuse and Haute-Marne regions in eastern France. Its mission is to study and design deep underground storage solutions for highly and moderately radioactive waste with a long half-life.

CODRA

CCS : Andra Control-Command Station using Panorama SCADA software.

" Our goal is to have a stable, maintainable system. We need a reliable solution for our critical site "

An underground laboratory was dug to observe on site the properties of a layer of a 165 million year old argillaceous rock of the Callovo-Oxfordien clay formation, and to develop construction techniques (for both digging and support) that will ensure long-term safety.

Choosing the Panorama solution

The facilities of the Andra underground laboratory include :

- about 42 acres of surface facilities including administrative offices, workshops, laboratories, and a public reception building,
- two access shafts, 4 to 5 meters in diameter,
- over 1,300 meters of underground tunnels, 445 and 490 meters deep.

The Panorama E² SCADA suite from Codra was selected to manage the site's BMS / FM. The Control-Command Station (CCS) is used for both operations and maintenance : heating / air conditioning, lighting, gas detection, fire detection, fire-resistant doors, etc. The underground tunnels were designed to meet horizontal constraints related to movement of tectonic plates. The site's different tunnels serve various purposes: scientific experiments, water recovery, emergency shelter, maintenance, etc.
The SCADA solution also manages scenario-based instructions in the event of fire : UAD (Decision Support Unit). Based on information forwarded to the CCS, the SCADA suite informs the operator of the appropriate procedure according to the actual situation in the tunnels. "For example: Staff located in elevators must put on their APEVA (autonomous evacuation equipment), evacuation performed by the CCS > Following steps...> Staff in underground tunnels must stop work, put on their APEVA, move to an emergency shelter, and follow the instruction panels," said Coralie Rostand, Operations Engineer and CCS Manager at Andra.

A geolocation system locates staff in the underground tunnels thanks to beacons placed at regular intervals. The site also has its own intervention team. Fifty trained volunteer employees carry out regular drills to be ready. In case of fire, they don their firefighter helmets and uniforms, and follow orders from the regional emergency service.

Supervision of the site began in 2007 with Panorama P², Codra's traditional SCADA solution. In 2012 the application was migrated

to Panorama E² in order to benefit from the latest advanced techniques such as:

a more open system,

the ability to create object components,

fast extension of the application, in particular with the opening of new tunnels, ...

"Our goal is to have a stable, maintainable system. We need a reliable solution for our critical site," said Jean-Marie Vincent, head of the Technical Department in Andra's Works Division. "We are satisfied with our new SCADA system — we do not plan to go back to the drawing board!".

"In order to take all necessary precautions, we switched over to the new system over the course of four Saturdays. We ran several series of tests. After two months of stable, reliable performance, we removed Panorama P2 entirely," said Vincent Dasse, Maintenance Manager at Andra.

Panorama IT, Codra's reporting tool, is also installed in the application. Andra has yet to define specifications for the information to analyze and for the type of reports required by users.

Extension of the site

To date the site includes more than an underground laboratory. There is a testing and exhibition building called the technology space. There is also an ecological library, a "life library". It is intended to preserve local samples of the fauna, flora, water, and earth obtained from different ecosystems: forests, plains, crops, an aquatic environment, the agri-foodstuffs chain, etc. These samples will be stored in cryogenic tanks at -150° for 100 years in order to preserve a record of the environment. The library's storage library is unique: it will store 4 tons of dry samples, 1.2 tons of cryogenized samples, and 1 ton of deep-frozen samples. Panorama E² will also monitor this new building, communicating with Sauter controllers.

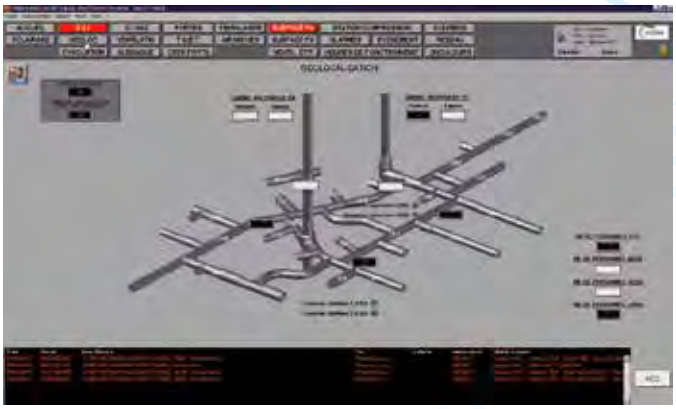
The Cigéo project

Cigéo (Industrial geological storage center) is a French project initiated to find a reversible solution for the deep underground storage of the most radioactive waste produced by all current French nuclear plants, until their decommissioning.

Construction of the facility, subject to approval for the creation of Cigéo, is planned to begin in 2018. The site should be ready to receive the first containers in 2025.

KEY FIGURES

- surface area: about 42 acres
- over 1,300 meters of underground facilities
- depth: 490 meters
- two access shafts, 4 to 5 meters in diameter
- speed of descent : 2 m/sec.
- max. 49 people working simultaneously underground
- 400 people on-site, including 150 from Andra
- 4 to 5 m of digging per week for the experimental phase
- age of argillaceous layer: 165 million years
- operating budget : 100 million/year
- 80 laboratories involved in research activities
- 12 partnerships



Geolocation of workers through beacons located throughout the 1,300 m of tunnels.

CODRA

Panorama and the Andra centers

Bird's-eye view of the Andra site: Underground laboratory for testing the storage of radioactive waste.

Well of access to the Andra underground Research laboratory - 490 m of depth.

The Panorama SCADA solution is also installed at Andra sites in the Aube and Manche regions.

Andra industrial centers in the Aube region :

Andra operates a surface storage center for low-to-medium level waste with a short half-life (Aube Storage Center- CSA) and another surface storage center for very low-level waste and for storing non-electronuclear radioactive waste (Industrial Center for Waste Consolidation and Storage - Cires).

Capacity :

- Low-level waste : 650,000 m3,
- Low-to-medium level waste : 1 million m3.

This center replaces the storage center in la Manche.

The Andra storage center in la Manche :

The la Manche storage center (CSM) is the first French center for the surface storage of low-to-medium level radioactive waste.

Capacity :

Low-to-medium level waste : 527,225 m3.

The center has entered a monitoring phase that will last several centuries.

From industrial SCADA to a global information system

Panorama E2

CODRA

Codra Software Limited
Herons Way - Chester Business Park - Chester - CH4 9QR – UK
Tel : +44 (0)1244 893221
E-Mail : sales-panorama@codra.fr - codra.net