



OIL & GAS INDUSTRY

Digital Transformation in Geotechnical Monitoring

Implementation of web-based SCADA software for satellite monitoring of inclinometers and piezometers at a leading natural gas exploration and supply company in Peru.

INTEGRATOR :



ENERTRONIC
INGENIERIA S.A.C

Project

The project focuses on the implementation of an advanced monitoring system for geotechnical control at the facilities of a leading natural gas exploration and supply company in Peru. Given the challenges of monitoring inclinometers and piezometers in remote and hard-to-access environments, the solution needed to ensure early detection of changes in soil stability and immediate notification of critical situations that could affect the integrity of the facilities and the safety of personnel.

Solution

To address these challenges, the atvise® web-based SCADA software was implemented. This solution enabled real-time integration and management of data from inclinometers and piezometers via satellite telemetry. With its native web access, advanced graph generation, interoperability, and cybersecurity mechanisms, atvise® facilitated precise and efficient monitoring of critical geotechnical variables. This approach reduced operational costs, minimized risks to personnel, and enhanced the response capability to potential landslides and soil instability.

In summary, atvise® proved to be a robust and scalable technological solution that optimized geotechnical control management at the facilities.

Client & Partner



Enertronic is a company with over 14 years of experience specializing in the development, engineering, implementation, and data management of telemetry in radio frequency, satellite, radial, and cellular networks.

Their focus is on providing innovative solutions for controlling and supervising industrial processes in Peru, with a global presence as well. They excel in the areas of industrial automation, SCADA systems, telemetry, telecontrol, and hydrometeorology.

Goals

- ii **Efficient implementation of satellite and radial telemetry** for monitoring hydrometeorological and geotechnical variables, enabling precise and real-time supervision of critical conditions at the facilities.
- ii **Optimization of geotechnical control** through the integration of web-based SCADA software, facilitating early detection of changes in soil stability and immediate notification of situations that could affect infrastructure and safety.
- ii **Reduction of operational costs** related to manual monitoring in remote and difficult-to-access environments.
- ii **Continuous improvement of operational efficiency** by ensuring the availability and integrity of acquired data and by utilizing an adapted and limitless monitoring and control system.
- ii **Ensuring compliance with the highest standards and requirements** in geotechnical control, telemetry, and industrial automation.

Challenges

- ii **Integration of satellite and radial telemetry technologies** to ensure stable and reliable communication in complex and variable industrial environments.
- ii **Development of an advanced,** intuitive, scalable, and secure web-based SCADA application that significantly enhances the visualization and management of geo-technical and hydrometeorological data.
- ii **Continuous training of personnel on the implemented systems,** ensuring their correct operation and maximizing their benefits.
- ii **Information security** and secure and reliable management of data to maintain its integrity and confidentiality throughout the entire infrastructure.





Results

- ii **A robust satellite and radial network was established**, ensuring stable communication for real-time visualization of hydrometeorological and geotechnical variables.
- ii **Geotechnical control was optimized** through the integration of an advanced web-based SCADA system, allowing for early detection of soil stability changes and immediate notification of critical situations.
- ii **Significant reduction in operational costs** associated with manual monitoring in remote and difficult-to-access environments, thanks to the efficiency of the implemented technological solutions.
- ii **Continuous improvement in operational efficiency**, ensuring the availability of accurate and reliable data for real-time strategic decision-making.
- ii **Compliance with the highest standards and requirements** in geotechnical control, telemetry, and industrial automation.

Background

This leading company in natural gas exploration and provision in Peru faced a significant challenge in manually monitoring inclinometers and piezometers at its gas plants. The reliance on periodic on-site visits to collect data caused excessive operational costs, potential risks to technical personnel, and limitations in the ability to detect early changes in soil stability. These issues not only represented a substantial financial burden for the company but also compromised the safety of operations and the integrity of the installations.

Solution

To address this problem, the decision was made to implement the atvise® web-based SCADA software, a cutting-edge technological solution integrated with satellite and radial telemetry for real-time visualization of inclinometers and piezometers. The adoption of this solution enables early detection of critical situations and immediate notification of adverse events, drastically reducing the operational costs associated with on-site visits. Moreover, its native web access capability, advanced graph generation, and connectivity via OPC UA provide a detailed view of the data, facilitating strategic decision-making.

By implementing atvise®, operational efficiency has been significantly improved, risks to technical personnel have been reduced, and the stability of the installations has been ensured, all while meeting the industry's most stringent standards and requirements. In addition to resolving the immediate challenges and objectives of this project, atvise® also lays the foundation for more efficient and secure geotechnical monitoring in the future.



Solution

The following flow of stages shows how the problem of geotechnical monitoring at the facilities was addressed:

ii Analysis of Needs and Challenges:

Identification of geotechnical monitoring challenges, including elevated operational costs, risks to technical personnel, and limitations in the early detection of changes in soil stability at the facilities.

ii Solution Design and Implementation:

Enertronic designs a solution based on atvise® and satellite and radial telemetry technologies. Remote self-sufficient visualization stations powered by solar energy and a battery bank are implemented.

These stations transmit information to a central database, which feeds data to the atvise® supervision system.



ii Testing and Validation:

Extensive tests are conducted to validate the functionality and effectiveness of the implemented solution. This includes verifying the accuracy of captured data, the speed of critical situation detection, and the effectiveness of immediate notifications.

ii Personnel Training

Enertronic provides training to personnel on using the new technological solution, emphasizing the importance of real-time monitoring, data interpretation, and decision-making based on updated information.

ii Continuous Monitoring and Evaluation

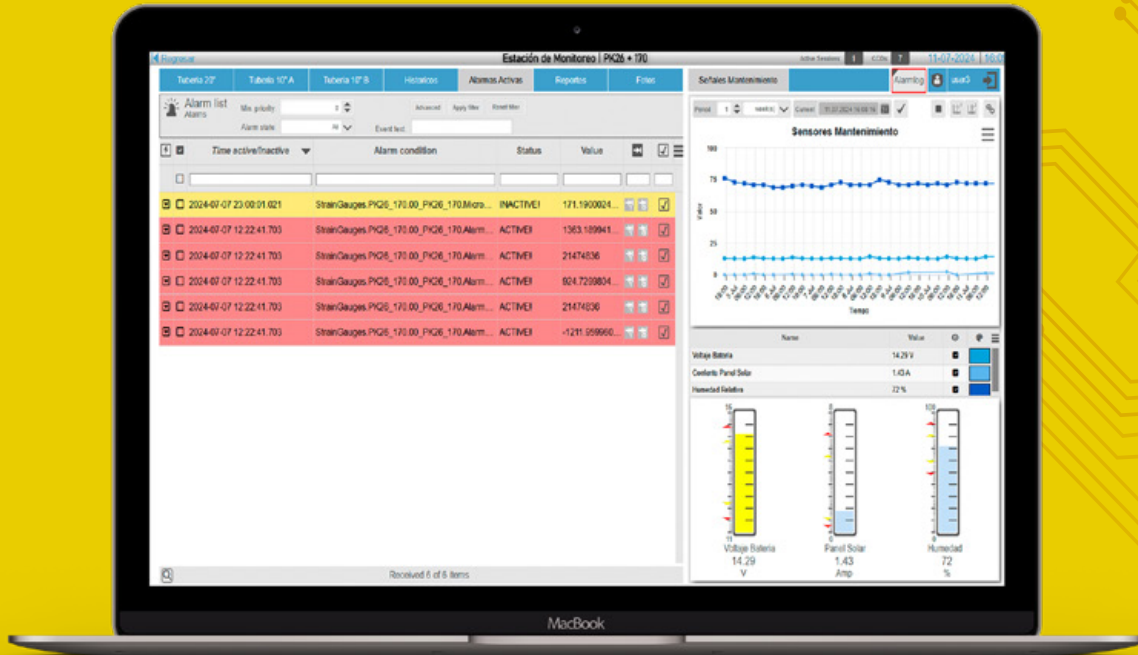
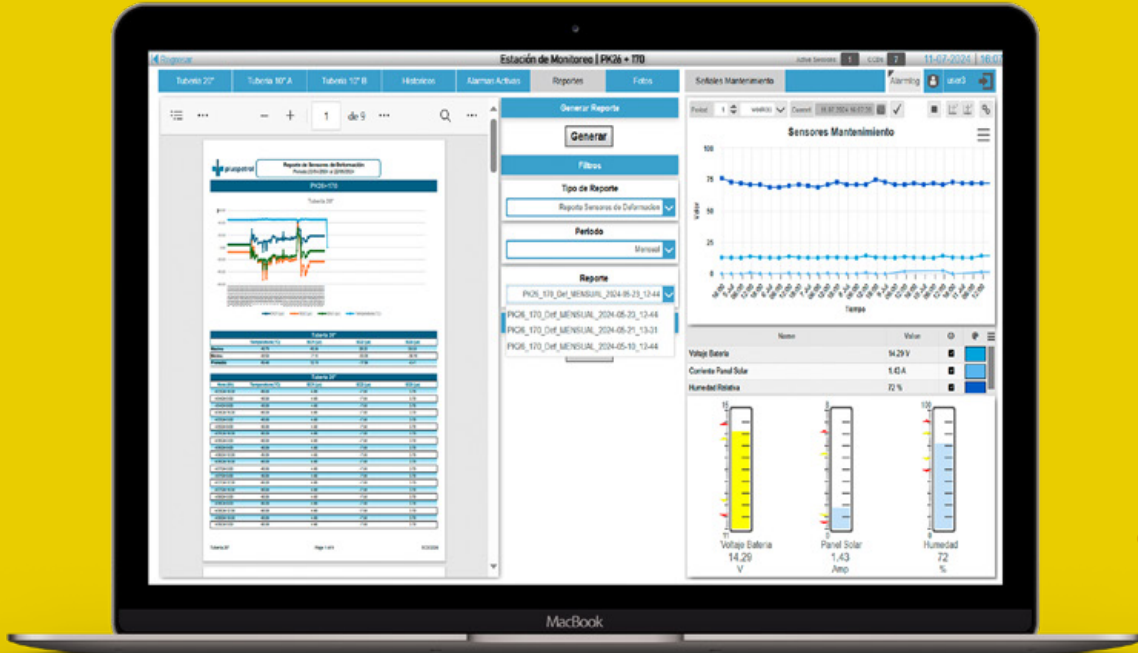
A process of continuous monitoring and evaluation is established to verify the performance of the solution over time. Adjustments and improvements are made as necessary to ensure operational efficiency and safety.

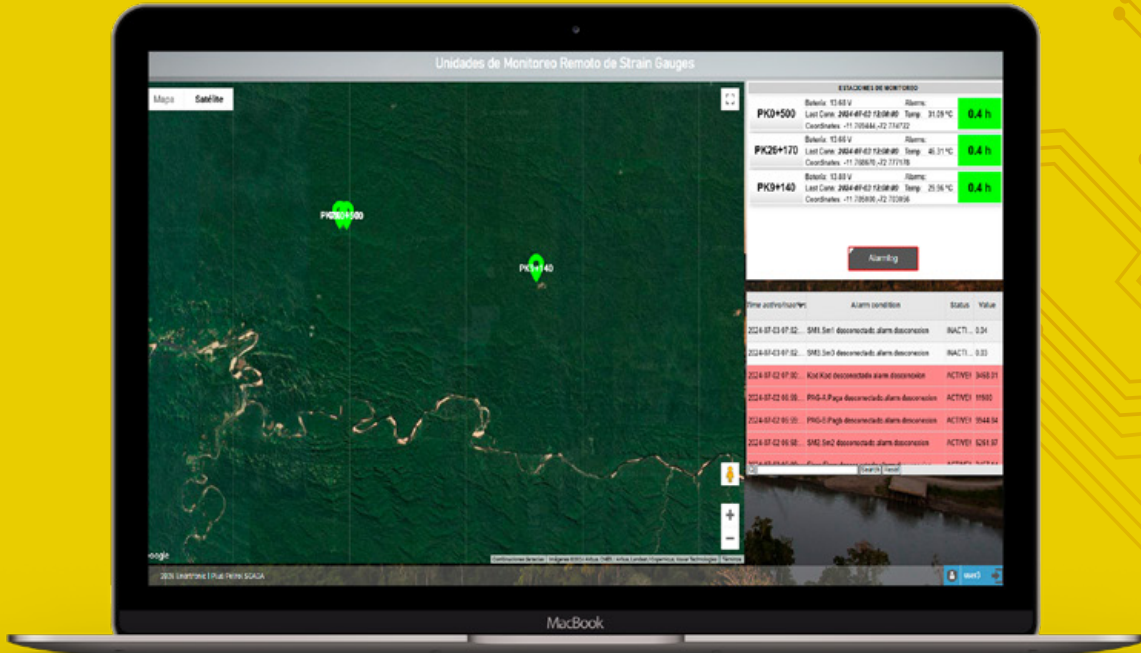


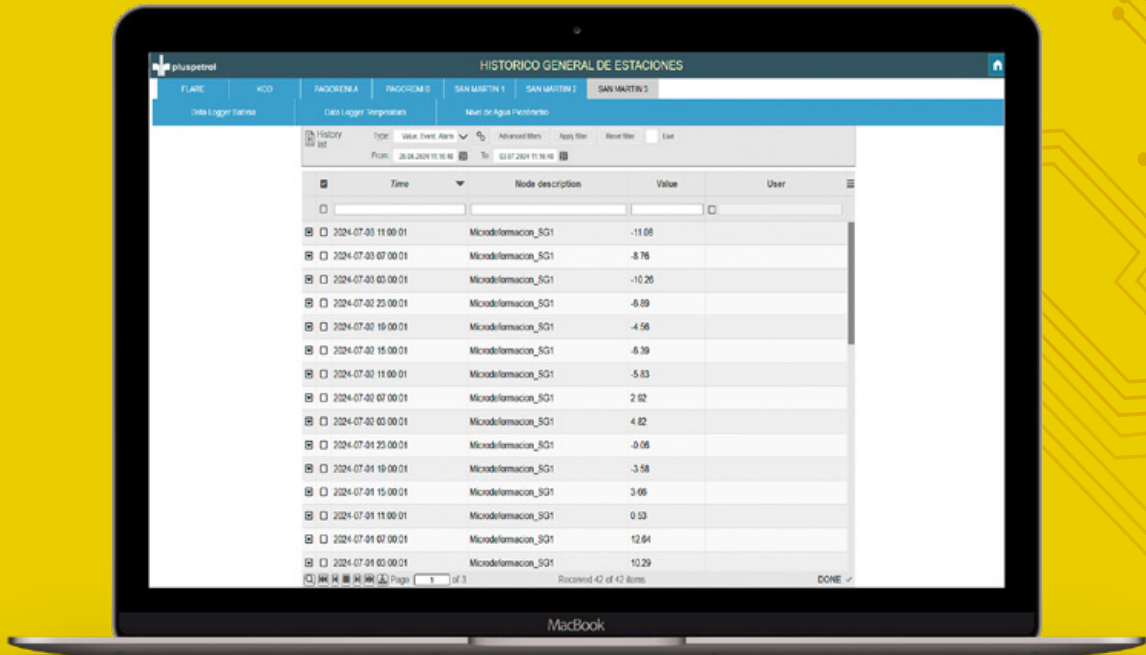
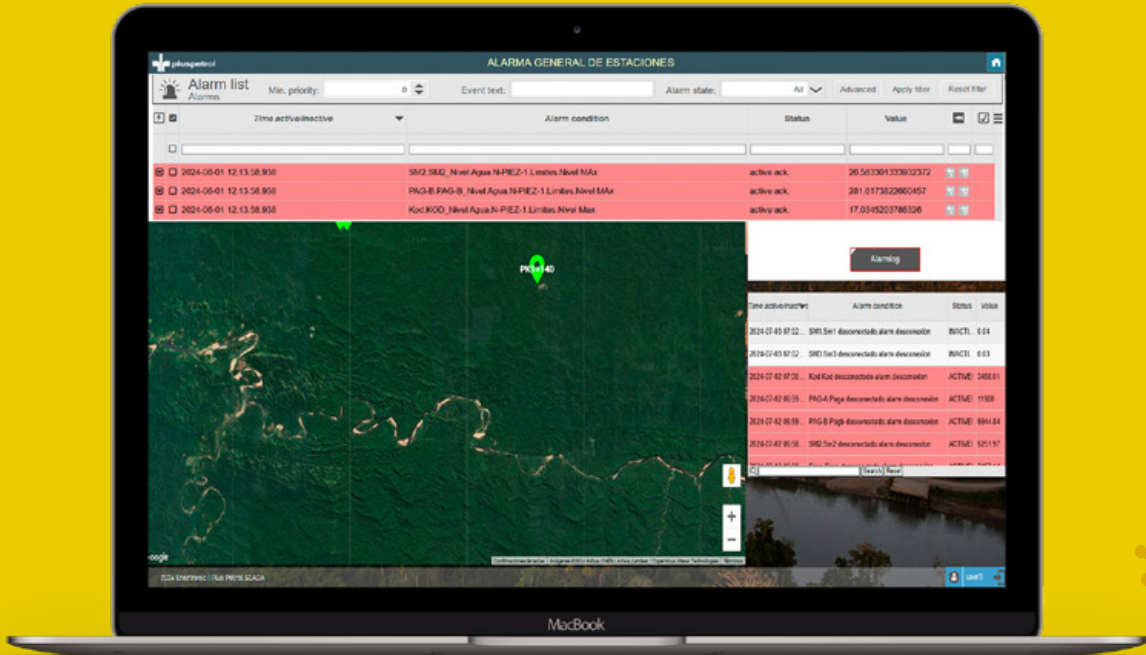
Solution

In conclusion, with the implementation of **Enertronic's** solution based on **atvise®**, geotechnical control was optimized, operational costs were reduced, operational efficiency was improved, and the safety of operations at the gas facilities was ensured.

This project sets a precedent for future collaborations with **Enertronic** and demonstrates the positive impact of technology on the geotechnical industry.









atvise® SCADA

SCADA SOFTWARE FOR INDUSTRY 4.0

The first HMI SCADA software built on Industry 4.0 fundamental basis: Pure Web Technology and OPC UA.

FREE DOWNLOAD atvise® SCADA



**Highest
Security**



**Responsive
Design**



**Pure Web
Technology**



OPC UA



Multiplatform



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