

Cupiagua Field Uses Precision Cooling for Energy Savings and Improved Availability



A Vertiv Case Study



Background

The Cupiagua field is located in Aguazul, Casanare, in eastern Colombia. As an important source of gas, it produces a capacity of 7,000 to 8,000 barrels per day. On-site management represents a considerable source of income for the local inhabitants, the nation, and oil and gas companies.

Almost since it began operations, the Cupiagua field has been using the same conventional, comfort air conditioning equipment, which generated high operating costs and low energy efficiency due to long-time use.

Using this equipment led to frequent power outages due to overheating of the electrical panels, especially in the storage facilities, control and gas reinjection rooms, the reinjection containers, and the field's main substation.

Challenge

Technological obsolescence is common in conventional air conditioners, which are generally used in spaces such as offices. However, these units cannot provide the precision cooling needed for ensuring proper operation of critical digital infrastructure such as computing, control room, electrical substation, and high-performance communication equipment.

In addition, the computers, control panels, and communications equipment at the Cupiagua field generated a heat density 6-10 times greater than a normal office space. This led to the need for an intelligent system that could quickly react to a drastic change in the heat load. The solution was needed to prevent major temperature fluctuations that could cause overheating and unplanned critical system downtime.

The technological obsolescence of the traditional heating, ventilation, and air conditioning (HVAC) systems that had been used were no longer adequate for the needed energy management.

The heat density of the existing critical infrastructure at Cupiagua field was 6-10 times greater than a typical office space, requiring an intelligent thermal management solution to ensure proper environmental monitoring and gas production continuity.



Liebert® MiniMate2



Liebert® PEX

Solution

To address the rising temperatures and increasing energy consumption, field managers chose to deploy the highly efficient Vertiv™ Liebert® PEX precision cooling system. These units, designed with state-of-the-art components, integrate microprocessors that enable automatic sequencing for adapting to load condition, reducing component wear, and maximizing the life of the equipment.

A Liebert® Mini-Mate2 thermal management system was also deployed. This efficient system offers cost savings and greater IT protection through variable capacity design, quick installation, lower maintenance requirements, and integrated management and remote monitoring.

The Liebert® PEX solution is designed to adapt to the different requirements of the Cupiagua field, which include precise environmental controls for temperature, humidity, filtration, and air flow.

It is now possible to control humidity within a range of ± 1 degree Celsius and $\pm 1\%$ since the control system analyzes the rate of change in temperature and humidity to anticipate what will happen in the space.

Vertiv also supplied detailed engineering support throughout the entire installation — from implementation and testing to commissioning of the project.

Results

The Liebert® units installed were configured to provide optimal cooling throughout the production lines, storage facilities, control room, gas reinjection room, reinjection containers, and main substation of the Cupiagua field.

Managers of the Cupiagua field saw a drastic reduction in corrective maintenance and parts replacement after updating their conventional air conditioning equipment with precision thermal management solutions from Vertiv. The project enabled electricity savings of 12% with no negative impact on availability and customer service.

With the deployment of Vertiv solutions, the field managers benefited from a comprehensive, integrated thermal management solution that did not require local adaptations, and they were able to more easily measure the air quality conditions at every facility in the Cupiagua field.

Project Scope

- 32 Liebert® PEX precision air conditioning systems between 20-35 kilowatts
- Liebert® Mini-Mate2 thermal management system
- Smoke, gas, and fuel sensors
- Intelligent Liebert® iCOM™ controls for electrical substation
- Engineering, installation, testing, and commissioning with follow-up technical support

Go online to learn more about how Vertiv's thermal management solutions can benefit critical facilities in the oil and gas industry.

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