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Preventative explosion protection upgrade

In 2018 the Cementos Argos Rio Claro plant in Colombia decided to modernise its complete explosion protection system to bring state-of-the-art protection to its existing coal mill plant. The customer selected robecca's proven solutions to handle the task...

The Rio Claro plant selected ATEX-compliant monitoring and control equipment for its coal plant protection upgrade, namely robecca's state-of-the-art gas analyser systems and a robecca secure centre (RSC) full automatic inert control system with functionality control.

After an inspection of the plant and a study of the new design of the coal grinding and coal storage silos, robecca started to design the equipment in mid-2018, with manufacturing during the second half of that year. Commissioning and handover of the equipment took place in June 2019.

Right: One of the new sample probes at the Rio Claro plant.

Safety concept

The robecca GAS system at the Rio Claro plant monitors gas at eight measuring points; the coal mill, two bag filters and five fine coal dust silos. The extractive gas measurements are divided into continuous and sequential measurements methods. All points measure CO and O₂ at the same time.

The robecca gas analyser (RGA), robecca sample probes (RSP) and robecca sample lines (RSL) were used for the gas analyser system. Engineering, design and installation of the entire system was realised in accordance with the European ATEX guidelines.

The fully-automatic RSC inert control unit was supplied as an intelligent interface between the gas analyser system and the CO₂ inerting system. The RSC controls all parameters of the gas analyser sys-



tem, coal mill temperature sensors, CO₂ inerting system, valves and flaps of the entire coal grinding process.

In the event of abnormal operational occurrences or CO / temperature alarms, the inerting process is automatically triggered to reduce the oxygen concentration below the limiting oxygen levels. This procedure prevents explosions and fires across the coal grinding system. State-of-the-art features support the operator to ensure that the system maintains high availability. The preventative explosion protection system interfaces with the main operator room, which enables the operator to monitor and operate the system in remote control mode.

Summary

With this new state of the art preventative explosion protection system the plant will benefit with a certified total safety system according to ATEX and CEN 15281 guidelines. Systematic and reasonable monitoring and control for the CO₂ emergency inerting process is realised to bring the coal grinding process to a high level safety standard. This will lead to fewer production stops and high availability of the cement manufacturing process.



Below: The Cementos Argos Rio Claro plant in Antioquia, Colombia.

