

MINERA ESPERANZA INTEGRAL OPERATIONS CENTRE

ABSTRACT

Minera Esperanza, belonging to the Antofagasta Minerals Group (with 70% ownership) in association with the Japanese firm Marubeni (30% ownership), is a copper and gold mine located 30 kilometers from the town of Sierra Gorda, in the region of Antofagasta.

Upon commencing operations, Minera Esperanza will reach annual production of more than 191,000 tons of copper in ore concentrates and more than 215,000 ounces of gold as its main sub-product.

One of the most important aspects of the project is that its operation will use only seawater, which will be pumped through a 145 kilometer long pipeline, between the sectors of Michilla and Esperanza. There will also be a dispatch dock for the concentrates in Michilla, in the district of Mejillones.

Another important innovation is based on the use of thickened slurries technology, which in accordance with the conditions in the area, will save more water and achieve greater physical stability.

Along these same lines, the mining company has implemented an innovative communications ring using Fiber Optics to connect the company offices, in the district of Vitacura, in Santiago, and its operations in the region of Antofagasta.

Within this context, in order to manage the process, Minera Esperanza decided to centralize its operations in an Integral Operations Center (IOC), and for this reason ABB has been chosen to supply major equipment and its 800xA Distributed Control System (DCS).

INTRODUCTION

In the current world climate, business, and especially mining, faces many challenges, some of which are protecting the health and safety of its workers, the effective use of time, reducing operation costs, improving administration and management of assets and finally, integral optimization of the business.

Similarly, the large amount of data generated in real time from different systems which interact in a mining operation require a control and management platform that can centralize operations to a single location and have the best information available for business decision-making, with relevant and timely data, broken down in an intelligent manner and displaying the performance trends of the operations.

To achieve this, consistent vertical integration must be applied to the systems of the different processes operated along the production chain, in order to generate change in the way operations are managed.

The complexity of this particular challenge is not insignificant, as it increases with the degree of interconnection of the different components of the process. In this specific case we have tackled the problem with use of an Integral Operations Center (IOC) on a Distributed Control System (DCS), of the workings of three Gearless Mill Drives (GMD) for the three mills (1SAG and 2 Bags), a Harmonic Filter Plant, Frequency Variators for the Grinder Conveyor Belt, Impulsion Pumps, an Electrical Scada, as well as the Dock Sub-Station in the Port.

Integral Operations Center (IOC)

According to studies carried out by ARC Advisory Group, in the USA, it has been seen that the industry losses around US\$ 20,000 due to down time from unexpected incidents and quality control problems. ARC estimate that around 80% of losses are avoidable and that 40% of these losses are due to operator error.

In this scenario, where the need to design an operations environment that is consistent with the administration and production objectives of the process becomes strategic, Minera Esperanza trusts in ABB, who, through the EOW platform, can provide solutions to optimize operator performance.

Both in the Integral Operations Center (IOC), located in the Minera Esperanza plant, and the Control Room located in the Dock Sub-Stations, the ABB proposal was the integration of the 800xA Control Platform and the EOW Work Station System, leading to a unified working environment where process information requirements can be broken down in real time, providing the operator with a fast and powerful decision-making process. All this is enclosed in a collaborative work setting with fully ergonomic work stations that are adaptable to the nature of the operation.

Remote Precommissioning

In order to optimize the project construction time, it was decided to install a remote Monitoring Control Room in the district of Vitacura, in Santiago, for which personnel from Minera Esperanza installed a Multiservice and redundant Fiber Optics ring between the mine's facilities in the 2nd Region, and the offices of Project Esperanza located in Vitacura.

The management of this solution was handled by a team of Project Engineers, On-site Personnel and ABB Engineers.

The group provided the conditions to hold Video Conferences between all the project's Control Rooms (Plant, Dock and Offices in Vitacura), Integrated Video in the process, as well as complete compatibility with each of pipeline stations.

Thanks to the services provided by the 800xA Control System and the Remote Monitoring Room we were able to attain the objective of carrying out, in the first stages, Remote Precommissioning of the large-scale equipment, such as the Primary Grinder and the Overland Conveyor Belt.

In addition the project was also able to optimize times as interoperability testing could also be carried out from Vitacura with different suppliers present at Minera Esperanza.

CONCLUSIONS

Minera Esperanza, using the 800xA Control System, the EOW platform and the fiber optics ring between Vitacura and Sierra Gorda, has all the tools necessary to remotely operate its processes from any of the control rooms linked to the process.

The development of the collaborative areas in each of the project's control rooms will provide all the facilities to increase productivity, reduce production costs and also facilitate the administration and management of the process.

