



MINERA LUMINA COPPER CHILE, CHILE

Key Facts

Company: Minera Lumina Copper Chile

Website: www.caserones.cl

Employees: 1,500

Mine Initial Investment: US\$4.2 billion

Industry: Metals & Mining

Country: Chile

Products Used:

- SmartPlant® Enterprise for Owner Operators (SPO) Core Solution
- SPO Operating Plant Solution
- Intergraph VTL* (Validation, Transformation & Loading)
- Intergraph Smart® P&ID
- Intergraph Smart Electrical
- Intergraph Smart Instrumentation
- Intergraph Smart Review
- PDS®
- 3D PACT
- Leica TruView
- CloudWorx™

MOVING TOWARD OPERATIONS AND MAINTENANCE EXCELLENCE WITH SMARTPLANT® ENTERPRISE FOR OWNER OPERATORS

South American mining company implements Hexagon PPM solutions to integrate engineering information from engineering to operations

Minera Lumina Copper Chile (MLCC) is owned by Japan's Pan Pacific Copper Co. Ltd., an integrated copper enterprise jointly established by JX Nippon Mining & Metals Corporation and Mitsui Mining & Smelting Co., Ltd., and Mitsui & Co. Ltd. MLCC develops and operates the Caserones copper and molybdenum deposit exploring mines 162 kilometers to the southeast of Copiapó, in the third Region of Atacama, and 800 kilometers to the north of Santiago. The company itself is based in Santiago, Chile.

IDENTIFYING GOALS

SCM Minera Lumina Copper Chile (MLCC) owns and operates the Caserones copper-molybdenum project in the Atacama Region in Chile. Caserones is a US\$4.2 billion development and construction project, encompassing facilities for an open pit and a concentrator plant for producing copper and molybdenum concentrates, all at an altitude of about 4,000 meters (13,000 feet) above sea level.

Operations began in 2012. Caserones has a 28-year mine life and the annual output of copper concentrates is estimated at 150,000 tons. Refined copper by means of solvent extraction and electrowinning (SX-EW) is produced at 30,000 tons annually. Molybdenum output is expected to be about 3,000 tons.

MLCC's main goal for its engineering information management strategy is to identify, capture, and reuse information developed during the project phase to achieve operation and maintenance excellence. This will optimize the return on investment and ensure a safe environment with demonstrable regulatory compliance.

*Intergraph VTL has since been replaced with newer solutions. Contact us for more information on how to achieve this functionality.



MLCC was using Microsoft® SharePoint® and other Microsoft applications, while the main contractor of the Caserones project used Hexagon PPM solutions and other proprietary systems. It became clear that the best option was to take the intelligent information from Hexagon PPM solutions, such as SmartPlant Enterprise Engineering & Schematics tools, and then make it available for operations by implementing SmartPlant Enterprise for Owner Operators (SPO).

The selection process was also driven by a gap analysis. This helped clarify MLCC's information management maturity status and roadmap to raise its engineering information management strategy to the next level. To MLCC, the use of integrated tools made a huge difference compared to other systems.

OVERCOMING CHALLENGES

MLCC wanted to ensure that all of the engineering information from various contractor companies was integrated properly and available for use by operations and maintenance. This required:

- Migrating a vast amount of data to become available for operations and maintenance
- Managing all intelligent engineering data in a centralized and integrated manner
- Implementing data-centric work processes to manage the engineering design basis for the facilities to ensure improved facility information integrity

Local Hexagon PPM partner Pixis, a Hexagon company, supported the implementation of the SPO tools Intergraph VTL* (Validation, Transformation and Loading), SPO Core, and SPO Operating Plant. It took only six months for the solution to reach full production. Pixis provided local implementation and training services, providing training for all 120 users in a

series of two-day sessions for groups ranging in size from 10 to 20 participants.

REALIZING RESULTS

Initially, more than 14,000 engineering documents and 36,000 pieces of vendor information related to 20,000 equipment tags were migrated from both Hexagon PPM systems and third-party systems. For this, Intergraph VTL* and Pixis customizations were used to rigorously control the quality of the data loaded into the target system, SPO Core. SPO Core is the tool that provides MLCC with rapid access to all key information and ensures the capture and maintenance of design properties in tag registers.

Currently, the system manages more than 120,000 documents and also acts as the central integration hub between data-centric Hexagon PPM tools, including SmartPlant P&ID, SmartPlant Instrumentation, and SmartPlant Electrical, as well as PDS. MLCC implemented SPO as the information management platform linking all necessary information. This means that the operations and maintenance teams have all of their information available from a single source that is constantly updated according to changes in operations. While the pre-configured SPO solutions have been essentially used out-of-the-box, Pixis also conducted some limited special configuration work for MLCC. Configuration changes were made to the properties of some mining equipment to better reflect the specific engineering environment. The desktop application was configured to optimize the search functionalities. Now all MLCC engineering, operations, and maintenance staff members can quickly access documents for:

- Impact assessment of engineering modifications
- Emergency response support
- Rapid decision support in the field



The functionality of the SPO solution against other systems is easily recognizable, especially when it comes to integration with engineering design tools and ensuring facility information integrity. For the Caserones project, we decided to implement information management through the Hexagon PPM tools because we are convinced this is an essential step to reach operational excellence.”

Patricio Soto
Information Manager, MLCC



MLCC enjoys significant business benefits, including:

- Up to 90 percent cost savings for engineering design changes thanks to the use of intelligent tools
- As much as 250 percent time savings for on-site engineering design changes, also due to the use of intelligent tools
- Minimized plant shutdown activities because up-to-date, as-built information is readily available

“The functionality of the SPO solution against other systems is easily recognizable, especially when it comes to integration with engineering design tools and ensuring facility information integrity,” said Patricio Soto, information manager for the Caserones project at MLCC. “For the Caserones project, we decided to implement information management through the Hexagon PPM tools because we are convinced this is an essential step to reach operational excellence.”

Immersive Training – Training staff on this new facility was a major undertaking that has been greatly assisted by reusing the PDS 3D model with the 3D PACT interactive training software from Hexagon PPM. Subject matter experts were able to create highly realistic training scenarios in 3D PACT without the need for programming or scripting. Trainees could work at their own pace without tying up scarce trainer resources or having to perform all training on-site where the working environment can be both harsh and hazardous.

The results of all training undertaken have been securely captured in the system.

MOVING FORWARD

MLCC is now in the third phase of implementation. This includes SPO Operating Plant and as-built generation using laser scanning technologies offered by Leica Geosystems. This solution will support the management of change process and ensure consistent handling and auditable traceability of changes through the review, approval, and implementation cycle. Out-of-the-box integration with SAP® will ensure that changes in the engineering design basis of SPO are reflected in SAP immediately. Similarly, changes in the SAP asset base through equipment installation and dismantling will be reflected in SPO. This bidirectional synchronization will ensure that activities such as maintenance and inspection planning, plus procurement decisions in SAP, are made based on the up-to-date status of the engineering design basis. This helps the company avoid:

- Incorrect maintenance execution
- Procurement of incorrect replacement equipment and parts
- Unnecessary costs related to incorrect information

KEY BENEFITS

- Quick, simple access to key engineering data and documentation to support operations, maintenance, inspections, and engineering activities
- Faster and better decision-making based on improved access to relevant information via multiple access routes
- Automated validation of engineering register deliverables to ensure data quality
- Ensured consistency of engineering data and documentation through integration of datacentric SmartPlant design tools
- Engineering change savings minimizing plant shutdown and information collection times
- Quick identification of missing information and links
- Improved training results and knowledge retention through 3D immersive training

ABOUT HEXAGON

Hexagon is a global leader in digital solutions that create Autonomous Connected Ecosystems (ACE). Our industry-specific solutions create smart digital realities that improve productivity and quality across manufacturing, infrastructure, safety and mobility applications.

Hexagon's PPM division empowers its clients to transform unstructured information into a smart digital asset to visualize, build and manage structures and facilities of all complexities, ensuring safe and efficient operation throughout the entire lifecycle.

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