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Minsur uses Powerproject 4D BIM to visualise and report on complex tailings reprocessing plant construction

MINSUR

Summary: Minsur SA is a Peruvian mining company that has been operating in the region for more than 35 years. It extracts and refines tin and copper, and engages in exploration for gold, silver, lead and zinc ores. Construction of its new tailings processing plant at San Rafael was so complex that it wanted full progress visualisation in 3D throughout. With the aid of Elecosoft Premier Partner APP Consultoría de Gestión de Proyectos and regional Elecosoft Approved Partner Metacontrol Ingenieros SAC, it turned to Powerproject BIM to complement its existing approach, ensure interoperability and generate informative visualisation of the as-built status throughout the project.

San Rafael is the main tin-producing mine in South America and the fourth largest in the world. It is located in the eastern Andes, producing about 10% of the world's tin.

The site has maintained a high standard of sustainability and environmental responsibility for many years, including its tailings management.

The company planned to build a new greenfield tailings reprocessing plant, known as the B2 Project. The process of managing a significant quantity of tailings required a complex configuration that included many different processing spaces, mechanical and electrical systems and extensive pipework, and the engagement of a wide variety of disciplines and specialist engineers.

Visualising construction complexity

The company felt that the development of this physically complicated project and its many sub-systems would be better understood if construction progress could be fully visualised at every stage, with information easily exchanged between the owner Minsur and its main contractor.

> *"Among several 4D solutions in the market, we chose Powerproject because of the sheer simplicity of connecting the main schedule with the 3D models. We are sure we will replicate this on forthcoming projects."* Jose Luis Hurtado

The original feasibility programming for the B2 Project at San Rafael was created in Primavera P6 – which remained the tool of choice for the main construction contractor – but was unable to maintain a continuous as-built 4D visualisation.

The company set out to bridge that gap. It chose Powerproject software, for its interoperability and ease of data exchange with P6 and because it could easily take progressed information and visualise it in a 4D programme, via the Powerproject BIM module.

Preparing the groundwork

The first step taken was to convert all the original 3D modelling for the plant into full Industry Foundation Class (IFC) files, regarded as the base interoperability standard for BIM data.

The second essential step was to convert the original baseline schedules from P6's .XER format into Powerproject files.

Carlos Peñaloza, Senior Lead Planner at the B2 project recalls: "The conversion process was effortless and fast. Converting the 1,300 tasks in the construction contractor schedule from P6 into Powerproject took only seconds. We reviewed the dates and links to ensure the data had converted correctly, and all of them matched perfectly."

The final foundation step was to create an easily repeatable and time-efficient process to update the 4D schedule with the weekly progress updates from Primavera – because inputting this information manually would have been effectively impossible.

Jose Luis Hurtado, Project Controls Manager at the B2 project stated firmly: "We could not force our contractors to use our chosen tool Powerproject – but we knew that updating progress manually would take too much precious time for our team."

> *"Using BIM and adopting digital technology is essential for any forward-thinking organisation in this market."* Carlos Peñaloza

Reducing the demands of reporting

To enable the weekly reporting, APP Consultoría recommended using Powerproject BIM from Elecosoft which could automate the updates from the .XER file directly into Powerproject files. Carlos explained: "We just had to let the macro work – then it only takes 60 seconds each week to update the entire schedule."

This meant that each week the 4D schedule could be rapidly updated to produce 4D BIM reports in various formats.

Using Powerproject BIM and another Elecosoft tool, o2c, the team was able to generate flipbooks to show weekly progress, videos comparing actual progress with the original baseline and 3D files so that managers could see progress in an interactive format.

o2c is a compression tool that enables you to present 3D objects animated at high speed in a compacted format which can be easily embedded in presentations and reports. Although Minsur's business technology was able to handle the processing demands of 3D modelling, the same could not be assumed for all parties.

Setting a new reporting standard

These functionalities, together with the 4D scheduling data, enabled the project team to show progress not just weekly to the management team, but monthly to senior executives. The rich 3D visualisation, animations, and detail about progress that these reports contained had shifted expectations and become a new standard for reporting quality that the team expect will be required on future projects.

The project team leaders were satisfied with their selection of tools. Jose Luis concluded: "Among several 4D solutions in the market, we chose Powerproject because of the sheer simplicity of connecting the main schedule with the 3D models. We are sure we will replicate this on forthcoming projects."

Carlos concurred: "Using BIM and adopting digital technology is essential for any forward-thinking organisation in this market. However, as the owners, Minsur doesn't have the time or resources to generate 4D schedules as the main construction programming, but with Powerproject we found a perfect complement which was easy to use and highly effective."

More information

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