CASE STUDY

Salobo Mine expansion: how Octave supported Vale with technological solutions to improve project management and execution

Key facts:

Company: Vale S.A.

Website: www.vale.com

Industry: Metals & Mining

Country: Brazil

Octave products used: InConcert Core *(HxGN SDx),* Forte 3D *(Intergraph Smart 3D),* Intergraph Smart Materials, OnSite Construction Planning *(Intergraph Smart Construction)*

The implementation of Octave's InConcert Core, Forte 3D and OnSite Construction Planning solutions provided Vale with greater precision, reduced rework and efficient integration for one of the largest mining projects in Brazil.

Vale S.A. is one of the world's largest mining companies, headquartered in Rio de Janeiro, Brazil. In 2023, the company reported revenue of USD 41.7 billion and has more than 234,000 employees.

Vale operates in various regions of Brazil, and one of its most significant projects is the Salobo copper mine, located in Serra dos Carajás, in the state of Pará.

Identifying goals

The Salobo mine is a copper sulfide ore extraction complex with two processing plants, Salobo I and II. Vale recently undertook the Salobo III project, with the goal of expanding its processing capacity by 12 million tons per year. This involved the construction of a new processing plant and the extension of power transmission lines.

The Salobo III project represented a huge challenge for Vale due to its magnitude and complexity. One of the main obstacles was managing the engineering data generated by the various disciplines involved in the project. A lack of integration and consistency between architectural, automation, civil, electrical and mechanical data could cause difficulties in aligning teams and result in delays and rework.

Additionally, Vale faced challenges monitoring and managing materials on the construction site. A lack of accurate visibility into available materials and replenishment logistics could cause disruptions in the construction phases, leading to failures in schedule and budget control. The need for detailed and dynamic planning made efficient coordination between the supply chain and field operations even more crucial.

Another problem that could arise in the Salobo III project was the rework caused by the lack of early clash detection between components during the design phase. Without integrated 3D visualization and review tools, many design errors could only be discovered once construction was underway, leading to costly corrections and lost time.

Key benefits:

- Significant reduction in rework with early clash detection using 3D models.
- Greater project accuracy, thanks to the automation of details and 3D visualization.
- Complete data integration between the engineering, procurement, and construction phases, optimizing project management.
- Additional cost reduction by identifying and correcting data inconsistencies early.
- Efficient training of operations and maintenance teams using 3D models created during the engineering phases.

Realizing results

To overcome these challenges, Vale opted to implement solutions such as InConcert Core, Forte 3D, Smart Materials and OnSite Construction Planning, all from Octave. The solutions were chosen to ensure the ability to centralize data management and integrate information from various sources and disciplines into a single digital environment, allowing everyone involved in the project to access the same information quickly and reliably.

With the right solutions, Vale ensured fluidity in the design and construction process. This allowed 3D models to be efficiently used to visualize project progress, review details and detect clashes before problems arose on the construction site. The ability to detect clashes significantly reduced rework, as potential problems were identified and resolved during the detailed engineering phase.

Additionally, Smart Materials provided Vale with a clear and accurate view of the status of materials on-site, allowing construction teams to work more efficiently and avoiding unnecessary downtime.

With the integration of engineering and procurement data, planning was improved, ensuring that the necessary materials were available at the right time, thanks to OnSite Construction Planning. Another key benefit was the platform's ability to provide direct support for project safety, through 4D simulations that enabled detailed analysis of construction plans. This allowed Vale to anticipate safety issues and reduce operational risks, both on-site and during the construction phase.

One of the most important aspects of implementing Octave solutions was the ability to generate detailed reports and dashboards that provided greater control

over project planning. This visibility helped Vale to better monitor costs in real-time, identifying risk areas and ensuring informed decisions were made while optimizing available resources.

Collaboration was key to the successful use of the solutions, facilitating communication between the different teams and stakeholders and integrating engineering, construction and commissioning data into a single, continuous flow of information. This enabled a smooth transition from design to the construction and operation phases, ensuring that Vale's operations and maintenance teams were properly trained, using the 3D models to gain a clear understanding of the facilities even before commissioning.

The successful delivery of the Salobo III project, which began operations in November 2022, not only significantly increased Vale's production capacity but also demonstrated how partnering with Octave and implementing the solutions can transform the management of large mining projects. Vale has created a digital environment that optimizes the execution of its projects and ensures greater operational efficiency, with reduced risks and greater control over its investments.

About Octave

Octave is a leader in enterprise software, turning data into decisive action and intelligence into your edge. Our software solves for and simplifies complexity, from the design and build to operations and protection of people, property and assets – for any scope, at any scale. For decades, we've partnered with customers to sharpen performance, elevate efficiency and amplify results. From factory floors to entire cities, our solutions are tuned to scale up what's possible from day one onward.

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