

Client Reference

Mining and Minerals | Platinum Reliability Block Diagrams



Client Background

The client is an industry leader in the mining and refinement of platinum and platinum group metals (PGMs) to South African and global markets. With multiple operations across the country and an ever-evolving market due to demand and rapid technological changes, it is vital to stay on the cutting edge through maintenance readiness initiatives.

Using Pragma's wealth of knowledge and resources, the project was undertaken to give the client a 'glimpse' into the future by creating a comprehensive reliability model through a custom-built reliability block diagram (RBD). By accurately modelling the process logic and asset dependencies, asset history, and failure modes, a digital twin of the operation could be built to give the client a platform to understand the requirements better and the expected performance of their assets.

Key Challenges

- Data verification and scrubbing to gain a better understanding of asset reliability.
- Transforming a complex process with many assets into a logical model to accurately simulate asset behaviour over a given simulation period.
- Using experience and industry benchmarks to model equipment without maintenance and reliability history.
- Managing strict timelines to give the client all the necessary information before plant commissioning progresses.



Value Add

- A custom-built reliability block diagram model to give the client a digital twin of their operation.
- Allow the client to better understand the potential challenges and bottlenecks to be expected.
- Allow the client to understand their assets and reliability at a granular level.
- The RBD model allows the client to perform scenario planning in a digital environment.
- Through RBD modelling, recommendations could be made regarding maintenance interventions, optimal shutdown frequencies, and equipment replacement.
- The RBD model can be expanded in future and provide the client with an opportunity to conduct resource requirement studies, material stock requirements, and detailed cost analysis.

“By creating a digital model representing the process and associated assets, the client has the opportunity to test various scenarios concerning maintenance interventions, allowing them to gain an improved understanding of the expected benefits and challenges before they are implemented on site”
– Asset Management Consultant

Pragma Intervention

- The maintenance readiness team embarked on a journey to condense a large amount of data into a usable format for analysis and modelling.
- Asset criticality and FMECA (failure mode, effects and criticality analysis) processes were employed to gain a better understanding of the critical path in the process.
- A digital twin in the form of a reliability block model was created to condense the complex operation into a logic-based path.
- Once the model was created, various scenarios and simulations were executed to give the client a better understanding of the potential challenges and bottlenecks which could be expected once the plant was operational.
- Detailed reports were generated to give the client an overview of the model, resulting in an overall improved understanding of what could be expected post-commissioning

Tools and Technology

- MS Excel for data cleaning, verification, and analysis
- Asset Criticality Models
- Isograph Availability Workbench for Reliability Block Modelling