

Client Reference

Mining | Coal

Customisation of Asset Tactics Navigation



Client Background

Our client has a coal open cast mine, with one DMS plant for the beneficiation of the raw coal as well as discard handling disciplines. The coal mines supply coal to both inland, Eskom, as well as export markets. The mine is broadly divided into three parts, the raw coal side, the DMS plant and the product coal side.

The main equipment on the Navigation plant which is part of Khwezela mine includes, but are not limited to, the following: raw and product coal stackers and reclaimers, conveyor belts, silos, pumps, screens, cyclones, ring roll crushers, HMEs as well as various Electrical and C&I devices. The type of asset in the plant includes, but are not limited to, conveyor belts, ring roll crushers, screens, pumps, cyclones, power reticulation assets etc.

Key Challenges

- High number of conveyor belts with each a different variant from the other ones
- Standard work packages used for all the different types of belts which pose risks with regards to labour capacity planning, the accuracy of the 5 year rolling plan as well as the Opex.
- Use of standard work packages for the variants also cause a SHE risk as critical components can be missed during inspections for specific variants which could lead to dire consequences with the DMR should there be a fatality.
- Reactive maintenance makes it impossible to track changes/modifications made to equipment resulting in inaccurate BoQs and obsolete technical data sheets
- Most equipment is client-owned but maintenance is done by a contractor which worsens the monitoring of the change management process.

Inputs to the Model

The customisation of conveyor belts required several key inputs:

- The original design technical data sheets if available
- Workshops to solicit feedback from site teams
- Life expectancy of components/maintainable items used for analysis
- Replacement value of the components.
- Manuals for any new components not part of the original design
- Labour rates estimate
- Walkabouts by site personnel & Pragma team to verify the accuracy of the data collected/equipment audits
- Meetings with GES, Foremen and Engineers.



Pragma Intervention

- Pragma team member collects, collated and verify data to use to align the work packages for the conveyors to the as operated models for each belt from site teams as well own pragma team walkabouts to carryout equipment audits, and compare with the original technical data sheets and design intent
- Pragma team customised plant conveyor belts for the BoQs to match the as operated belts
- Pragma team developed tactics for maintainable items which are specific to Navigation plant
- Pragma team developed a more efficient method to use to customise modular, high variant assets based on Lean six sigma concepts.
- Pragma team carried out analysis to establish the difference in the total number of components for selected maintainable items which would result if budgeted on a standard 6 pulley belt vs using actual customised belts
- Pragma team established the manhours required per the clients internal staff for the standard and customised belts spread over a 52-week plan to establish whether it is currently over/ under budget.
- Pragma team collected replacement values of components and life expectancy of the components.
- The Pragma team did a LCCA to establish an Equivalent Annual Cost (EAC) used to assess if the 5 to 20-year plan will be accurate if the standard conveyor is used for budgeting.



Value Add

The outputs of the customisation process include:

- A more accurate budget on renewals or the long term maintenance plans. The underbudgeted for Navigation for component replacement (EAC) is R 2 427 641.88.
- More accurate loading of labour which would improve schedule completion. Currently, labour is underbudget by 27 Man-days per year.
- Work packages which would give tangible evidence for audits and investigation by the DMR.
- A methodology which would significantly reduce the time to customise modular, high variant assets by 30% and minimise errors.

Tools and Technology

- Rylson 8 Software (Ausenco)
- Excel modelling and analysis
- Lean/Six Sigma analyses tools