PALABORWA MINING COMPANY – CASE STUDY
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INTRODUCTION

Palabora Copper (Pty) Limited, a subsidiary of Palabora Mining Company Ltd, is a copper mine that also operates a smelter and refinery complex based in the town of Phalaborwa, in South Africa's Limpopo Province. The mine owes its origins to a unique rock formation in the region known as the Palabora Igneous Complex.

Palabora has been operational since its incorporation in 1956 and is the country's major producer of refined copper, producing approximately 45 000 tonnages of copper per annum. Palabora Copper is South Africa’s sole producer of refined copper, which it supplies mainly to the local market and exports the balance. Whilst copper forms the base-load of its business, Palabora also mines and exports other by-products such as Magnetite, Vermiculite Sulphuric acid, anode slimes and nickel sulphate.
Conventional Chute – Belt Damage

Palabora Mining Co. is operating a 1.3km long inclined conveyor fitted with a 1.05 m wide steel reinforced belt transporting about 1900tph of primary crushed run of mine ore. The belt is fed from 4 crusher storage bins by short conveyors feeding onto the belt at right angles. The belt is scanned by x-ray 3 to 4 times per year to determine its condition. An analysis of the damaged experienced on the reinforcing cables, indicated severe damage probably caused by large lumps of ore falling on the belt.

The most damage was caused by material from the first or second of the cross conveyors which feed directly onto an empty belt.
CONVENTIONAL CHUTE – BELT DAMAGE

Photograph 2 & 3 – Belt damaged
WEBA Chute

During 2008 it was decided to test a WEBA chute on the first transfer point. The first WEBA chute was installed on the 29th January 2008. The results were impressive and it was decided to install another WEBA chute to cater for instances where the first cross conveyor is not operational. The second WEBA chute was installed on the 4th December 2008.

To determine the effectiveness of the WEBA chute to protect the belt, the annual average cost for replacement belts from 2006 to 2008 were calculated at 2009 prices. The costs for the belting for 2009, were determined and it indicates a saving of R587 000.00 in belting alone. Considering the additional production gained through less down time and the saving of direct costs of other materials and labour on fewer splices made, that amount can most be increased by, at least 50%
Significant cost savings on maintenance and plant down time continue to be made annually as a result of the WEBA chute installation which has required minimal maintenance over the past 8 years.

The initial ROI for the chute supply and installation was less than 12 months.

It should be noted that the belts lasts so long now that deterioration of the splices are now becoming the main driver for stoppages.

Inspections are being carried out on a regular basis and feedback are received from the client every few years.

The results are still the same, there are hardly any damage done to the belt.
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