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HEALTH & SAFETY CONFERENCE

2015



Anglo American Moranbah North Mine

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Introduction

- Anglo American - Moranbah North Mine
- Underground Coal Mine – Longwall Operation
- Bowen Basin, Central Queensland
- Pulley String Catcher



Pulley String Catcher installed on loop take up pulley before installation



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The Issue

- String ingress to the pulley labyrinth seals
- Conveyor belt string from damaged edges of belt
- Edges damaged due to tracking
- Caused by idler failures, bootend pushes, mechanical or vulcanised joints
- Age of conveyor belt and retraction process

String and rubber removed from pulley seals underground



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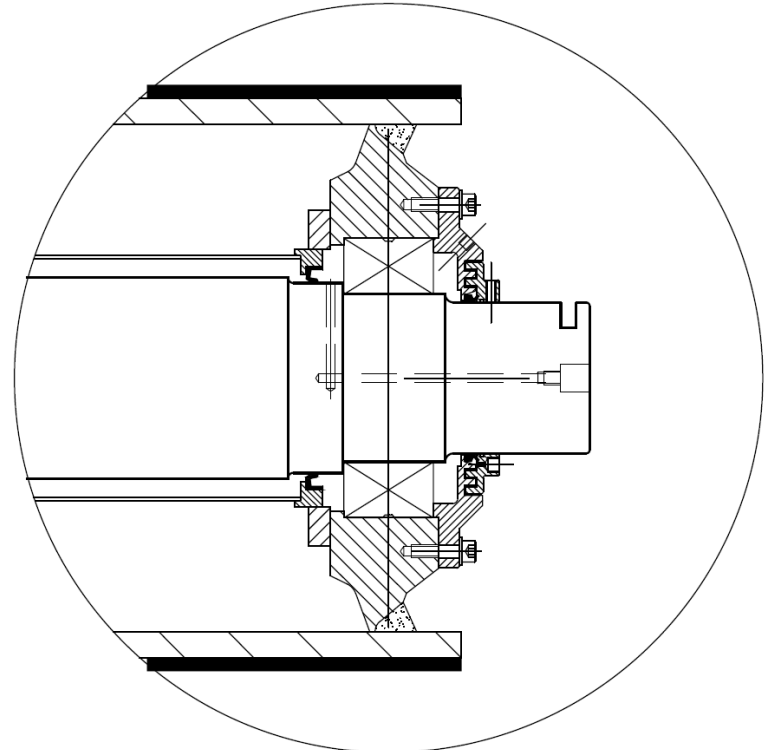
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Safety Concerns

- Risk to coal mine workers with potential for underground fires
- Seal failure due to ingress of string
- Allows ingress of dirt and water to the bearing
- Causes bearing failure
- Friction with combustible materials present, grease and string fibres

Labyrinth Seal breakdown



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Safety Concerns

- This mode of failure has been seen on 7 pulleys at Moranbah North Mine

Failed Moranbah North Pulley due to string ingress



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Safety Concerns

- Risks to coal mine workers regarding pulley changeout activities
- Weight of the pulley being between 1.5 to 3 tonne
- Narrow walkways and low headroom
- Process in which pulleys have to be re-slung
- Need to reduce the risk to coal mine workers by reducing the requirements for pulleys to be changed out



Confined work environment



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Design Specifics



- Modification of the currently used pulley blocks
- Robust bars added to the pulley blocks
- Redesign of the pulley blocks allowing greater ability for visual inspection
- Allows for grease to be seen purging and whether string is building up around the seals



Comparison of old conveyor pulley blocks to the new style with the string catcher installed allowing more of the pulley to be seen



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Implementation and Results

- Trial installed on pulley in LW110 conveyor loop take up
- Significant amounts of string built up around the pulley string catcher
- Labyrinth seals have been left clear
- Easier to cut clear of the string catcher rather than clean out of pulleys
- All of these factors have reduced the risk to coal mine workers through reducing bearing failures and higher risk activities



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Implementation and Results

Pulley string catcher installed underground removing string from the belt



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Conclusion

- Reduction in risks associated with potential underground fires
- Reduction in exposure for coal mine workers to manual handling and pinch point activities
- 7 pulley failures prior to installation, no failures have been seen since due to a strict regime of cleaning the seals and the work of the string catcher
- New standard for the Loop Takeup of the longwall block and form part of the panel belt installation standard
- To be reviewed for all conveyors at Moranbah North Mine for at least the improvements to visibility of the seal



Pulley String Catcher installed on the loop take up pulleys before installation underground

