

CASE STUDY: Transmission Abuse & Engine Overspeed

Problem

Operator handling has an enormous impact on the lifespan and health of machinery. Abuse warnings give operators decision making capability to prevent problems such as transmission abuse and engine overspeed.

Transmission abuse occurs when an operator changes gears from neutral to forward/reverse with an engine speed above 1500 rpms. This sudden load change can cause a shock to the system, capable of causing serious damage to the component.

Engine overspeed occurs when an engine is forced beyond its design limit. With some engines, even momentary overspeed can greatly reduce engine life and cause serious damage to the machine.

Transmission abuse and engine overspeed damages components, disrupts the production schedule and results in costly warranty and maintenance issues.

Study

The purpose of this study was to assess the frequency of transmission abuse warnings and engine overspeed warnings on a small high-grade gold mine that had recently implemented iVolve's *Mine4D Maintenance* capability.

Solution

The iVolve system was installed in order to give operators sufficient warning before mechanical abuse occurs, reduce the amount of damage to assets and reduce maintenance and warranty costs.

Mine4D Maintenance solution utilises on-board vehicle management systems to provide real-time equipment health data feeds. This data is displayed graphically via *iReport* dashboards at fleet and individual asset levels, with full data history available for informal and scheduled reporting.

In the event of alerts, *Mine4D Maintenance* provides onscreen alerts within iControl providing true, real-time decision-making capability.



Findings:

There were two key areas of findings surrounding transmission abuse warnings and engine overspeed. In both instances, there was a significant improvement in operator behaviour as a result of *Mine4D Maintenance*.

Transmission Abuse Warnings

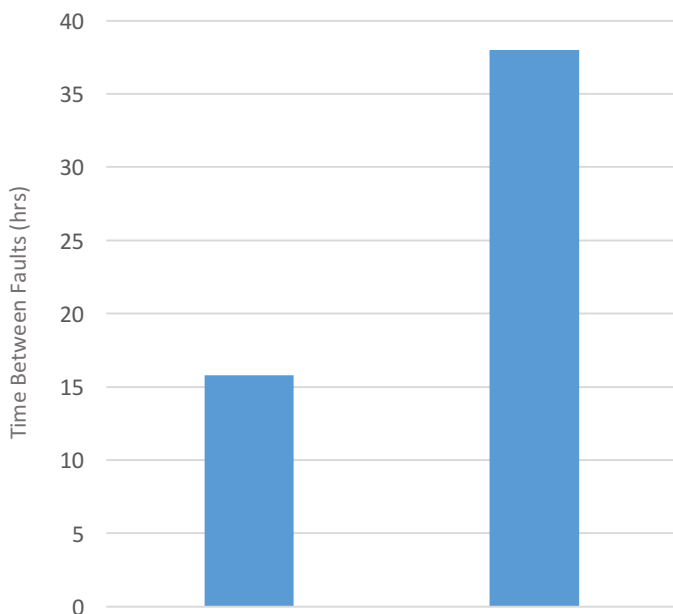
When the operator changed gears from neutral to forward/reverse with an engine speed above 1500 rpm a Transmission Abuse is logged. This can result in a shock to the system by causing a sudden load change in the transmission which is capable of causing damage to the component.

Engine Overspeed Warnings

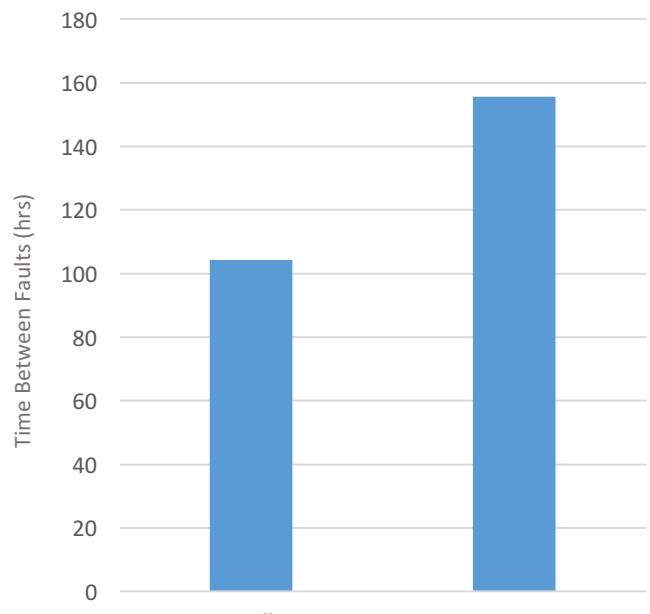
Engine Overspeed alerts occur when the RPM's of the engine increase above the rate of which is deemed within tolerances by the manufacturer. Since installation of *Mine4D Maintenance*, operators were given an extra 51.4 hours of notice before mechanical abuse occurred.

Significant improvement in operator behaviour shown by increased time between warnings of 22 hours.

Increased time before abuse warning on iVolve trucks by 51.4 hours.



Graph 1: Time Between Transmission Abuse Warnings



Graph 2: Time Between Engine Overspeed Warnings

iVolve

Established in 1995, iVolve is an Australian industrial technology company delivering real-time machine intelligence to the resources sector enabling our clients to make educated quick decisions to increase productivity, reduce costs and minimise risk.

iVolve's **Mine4D**, records and presents crucial operational data for the monitoring and management of a mining fleet. This provides all levels of the mining operation the knowledge to back smart decisions.

Our experienced R&D team at iVolve are passionate about research and keeping the company at the forefront of innovative, yet practical solutions for our clients. As a result, the company has built a solid reputation over the years as a leader in its field.

If there is an opportunity for productivity improvement within your operations, our team are always ready to assist.

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