

CASE STUDY

Komatsu 930E Diesel Engine Life Extension



AT A GLANCE

Challenges

- Extending engine life without increasing the risk profile of the engine
- The client's fleet had a significant variation in SMU hours and review was necessary to determine which trucks would benefit the most from a total cost of ownership point of view.
- Short comings in their condition monitoring program particularly around oil analysis data and the required actions to investigate and mitigate a failure.



SCHEDULE
YOUR
MEETING
NOW



"The wealth of knowledge demonstrated by the HolisticAM reliability engineer showed they were highly skilled and experienced"

Maintenance Manager

THE ADDED VALUE

HolisticAM created value for the mining company by:

Value One

Reducing the number of engine overhauls required on targeted trucks

Value Two

Fleetwide total cost of ownership saving of \$20M+ without adversely affecting the risk profile of the engine

Value Three

Increased condition monitoring program effectiveness with documented actions to verify and validate oil analysis results to prevent unplanned failures of the engine



PROJECT OVERVIEW

The Komatsu 930E Electric Drive Haul Truck has been used by the client to remove overburden across multiple open cut mines in Australia.

Holistic Asset Management (HolisticAM) was engaged the mining company to undertake detailed review of the the Diesel Engine expected life with a focus to extend the changeout frequency, thus reducing the number of overhauls required across the life of the truck.

The objective of this project was to review the current maintenance strategy, understand whether the engine was capable of achieving more life and identify recommendations to achieve any life extension.

The project utilised a hybrid onsite-offsite execution approach and was delivered on time and within budget.

THE CHALLENGE

The client wished to extend the life of the fleet well beyond 100,000 chassis hours and identified engine overhauls as a major contributor to the total cost of ownership associated with the truck.

The client's fleet had a significant variation in SMU hours and review was necessary to determine which trucks would benefit the most from a total cost of ownership point of view.

The client had expressed some concern about the short comings in their condition monitoring program particularly around oil analysis data and the required actions to investigate and mitigate a failure.

A key challenge was to quantify and determine the level of risk which was acceptable to the client. Any increase in the risk profile had to be mitigated.



THE SOLUTIONS

The client chose HolisticAM based on their OEM, condition monitoring expertise, on-site experience and proven track of delivering results in the mining industry.

As with all projects executed by HolisticAM, our methodical approach includes identifying the current state, identify and review opportunities for improvement and presenting these opportunities to the client for consideration.

HolisticAM worked closely with the client's engineering, planning and maintenance execution team to undertake the following reliability engineering tasks:

- Review of engine maintenance strategies including a review of the condition monitoring philosophy
- Provide updated FMECA
- Review of oil analysis data including oil hours, generation of wear metals, Total Acid Number (TAN), Total Base Number (TBN), viscosity, oxidization, soot generation, fuel dilution and coolant ingress to determine if there was any adverse events that would have a detrimental effect on engine life.
- Historical Review of strip reports focusing on the condition of the crankshaft, block, bearings, pistons, cylinder liners, cylinder heads, camshaft, valvetrain and turbochargers.
- Review of engine load factor / fuel burn.
- Review of historical engine fault codes that may have indicated an engine abnormal condition.

THE RESULTS

Key deliverables included:

- Review of the existing diesel engine maintenance strategy
- Gap analysis of condition monitoring strategy
- Recommendation to increase the engine life by 20%
- Recommendations of engine mid-life frequency and scope of work to maximise engine expected life
- Updated FMECA
- SAP Master data changes for task lists and operations for the engine mid-life.



THE ADDED VALUE

HolisticAM was able to create value by

- Reducing the number of engine overhauls required on targeted trucks
- Fleetwide total cost of ownership saving of \$14M+ without adversely affecting the risk profile of the engine
- Increased condition monitoring program effectiveness with documented actions to verify and validate oil analysis results to prevent unplanned failures of the engine



Who are we?

Holistic Asset Management is a leading provider of advanced reliability engineering technology and services to the asset intensive industries. We work with our customers to develop tailored solutions that meet the needs of their individual operations and help them realize significant savings in their maintenance costs.

We are proud of the reputation we have earned as a reliable and advanced engineering services provider to the mining industry. Our commitment to our customers is to provide the most reliable and advanced engineering solutions that will help them improve their reliability management systems and ultimately reduce their operational costs.

Unlock the full potential of your assets with our services. Contact us today to schedule a consultation and discover the difference we can make.

www.HolisticAM.com.au