

## CASE STUDY

Hitachi EX5500 / EX5600 Hydraulic  
Excavator Critical Spares  
Determination using RBD



## AT A GLANCE

### Challenges

- FMEA was present, however there was no criticality analysis undertaken
- Rationalization of parts to determine what parts were common and interchangeable between the EX5500 and EX5600.
- Using current data to model and predict the future performance of the asset to justify the purchase and stocking of additional spares.



**SCHEDULE**  
**YOUR**  
**MEETING**  
**NOW**



"Using our data to create a Reliability Block Model of the excavator was a clever way to predict performance and determine critical spares holdings"

*Engineering Superintendent*

## THE ADDED VALUE

HolisticAM created value for the mining company by:

### Value One

Predicted savings of \$4.6M over 5 years by ensuring the right part is available when required.

### Value Two

Increase in fleet availability and reduction in MTTR

### Value Three

Determined the risk profile across all systems, subsystems and maintainable items on the hydraulic excavator.



## PROJECT OVERVIEW

The client has a fleet of Hitachi EX5500 and EX5600 to load coal into haul trucks.

The client had identified that their hydraulic excavator fleet had not achieved their forecast availability with numerous major component failures combined with increasing Mean Time to Repair (MTTR) resulting in production loss. Holistic Asset Management (HolisticAM) was engaged by the mining company to undertake a review of their Hitachi excavator fleet critical spares.

The objective of this project was to understand key drivers for extended MTTR and to make a critical spares determination for the fleet.

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

## THE CHALLENGE

Leveraging our OEM and site based experience we understand the challenges that mining companies face. Materials shortages and global logistics delays have driven up parts costs and lead times have increased resulting in extended downtime for assets. Some key challenges faced during this project included:

- Downtime Data reporting
- The client had an FMEA, however had not undertaken Criticality Analysis.
- Determining which parts to hold and the minimum stock holding to ensure continued availability of the fleet. As the fleet ages, there is an added risk of age-related failures. It was important to accurately predict performance of the excavator and its parts consumption.
- Rationalization of parts to determine what parts were common and interchangeable between the EX5500 and EX5600.



## THE SOLUTIONS

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

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

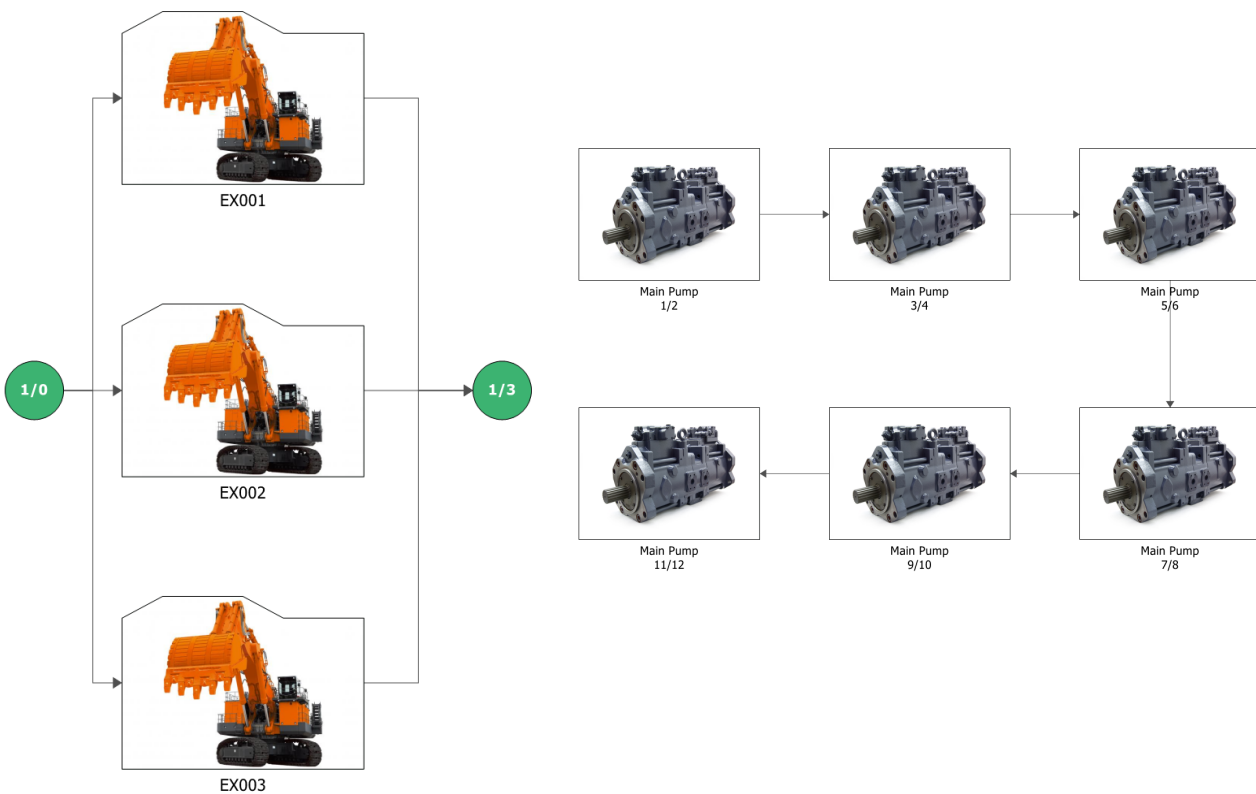
HolisticAM worked closely with the client's engineering, planning and maintenance execution team to undertake the following reliability engineering tasks:

- Downtime Data Analysis to determine systems, subsystems and maintainable items that contributed to unplanned maintenance on the trucks
- Life Data Analysis (LDA) was undertaken to determine the Failure Characteristics, Mean Time Between Failure (MTBF) and reliability.
- FMECA development including criticality analysis to determine the risk profile of the excavator
- Identify parts costs, logistic delays etc.
- Reliability Block Diagram (RBD) modelling of the excavator to undertake 'what-if' analysis to determine recommended spares holdings.

## THE RESULTS

Key deliverables included:

- Updated FMECA
- Critical Spares identification
- Minimum Spares holdings by fleet wide availability against spares quantities
- Prediction of fleet performance over the next 5 years using RBD Models



## THE ADDED VALUE

HolisticAM was able to create value by

- Predicted saving of \$4.6M in production loss over 5 years by ensuring critical spares were on hand
- Increase in fleet availability and reduction in MTTR
- Parts rationalisation across the fleet



## 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](http://www.HolisticAM.com.au)**