FRASER-LEVER
engineered advantage

CASE STUDY:

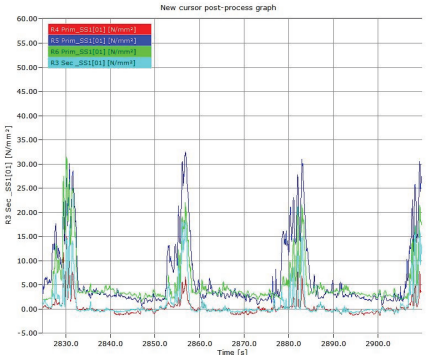
STRAIN GAUGING OF 250 TONNE EXCAVATOR

Client:
South32

Location:
Groote Island,
Australia

Mineral Type:
Manganese Ore

Services Provided
- Strain Gauging
- Data Analysis



Situation:

South32's manganese mining operation at Groote Eylandt currently utilises a fleet of three 250 tonne Hitachi EX2500 backhoe excavators. South32 engaged Lever to provide strain gauging installation, data collection and data analysis. The aim of this was to understand the operating conditions which resulted in elevated stresses and fatigue cracking in the boom and track frame in the excavators.

Challenge:

The installation of strain gauges and recording equipment on large mining excavators comes with many challenges such as harsh operating environments, limited installation time, complicated geometries, significant cable distances, and limited power sources to name a few.
It was essential that the chosen locations of the strain gauges maximised the value of the collected data as there was only one window for installation.

Solution:

Lever approached this project from the ground up and developed a customised installation that would deliver reliable measurements of the strains. This data ultimately lead to practical and achievable steps to reducing the cracking of the excavators whilst still maintaining production targets.

Data collection was achieved using the HBM QauntumX data acquisition system which permitted integration wireless data acquisitions in the track frame, hard wired data acquisition on the boom and synchronised video recording of the machine operation. Simultaneous recording of 32 strain gauges was achieved at sample rates of up to 100 Hz.

The data processing, analysis and interpretation was performed by Lever. Lever identified that several specific mining practices were resulting in high peak stresses and were able to recommend practical solutions including specific weld detail modifications and changes to mining techniques which would reduce cracking and improve productivity.

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