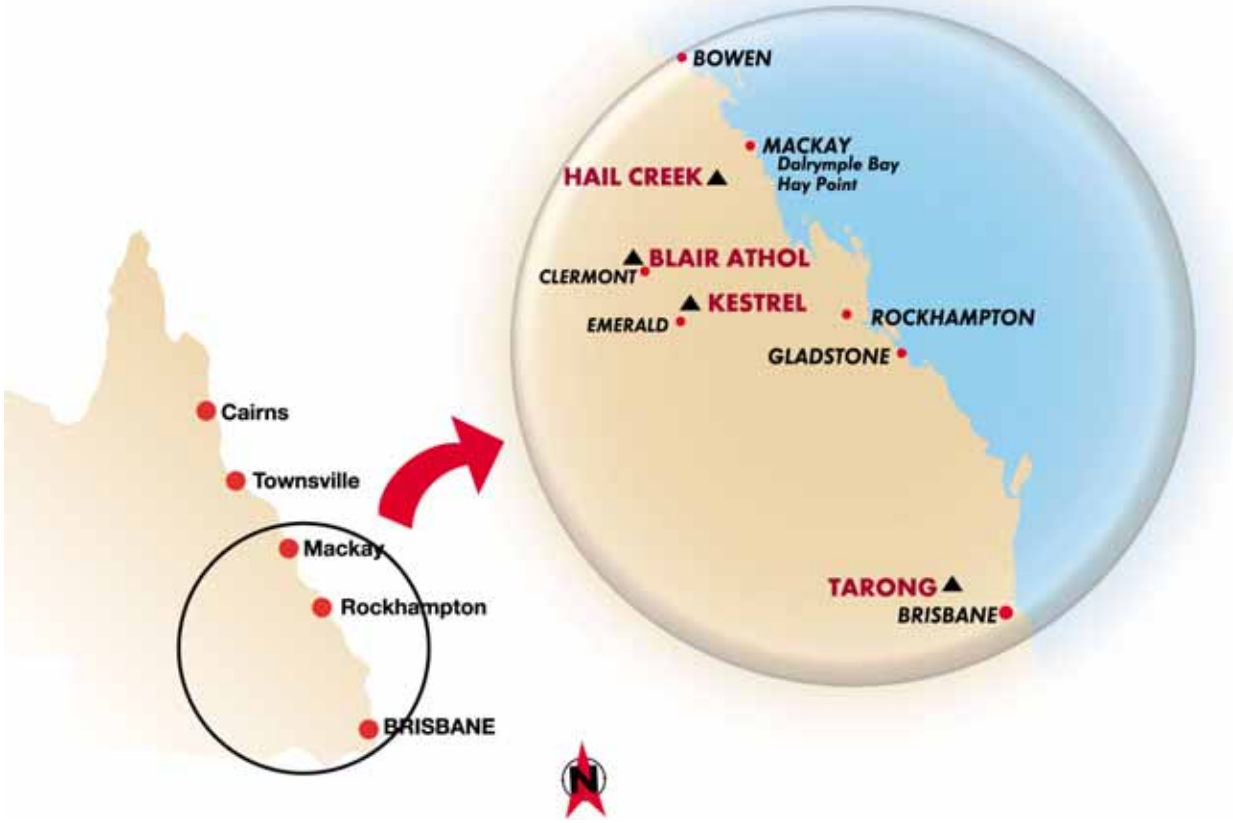
Load Cells for Dragline Hoist Rope Tugger Winches

Scott Verrall and Ian Meads
Hail Creek Mine

RIO TINTO
COAL AUSTRALIA

Hail Creek Mine – locality map



Hail Creek Mine

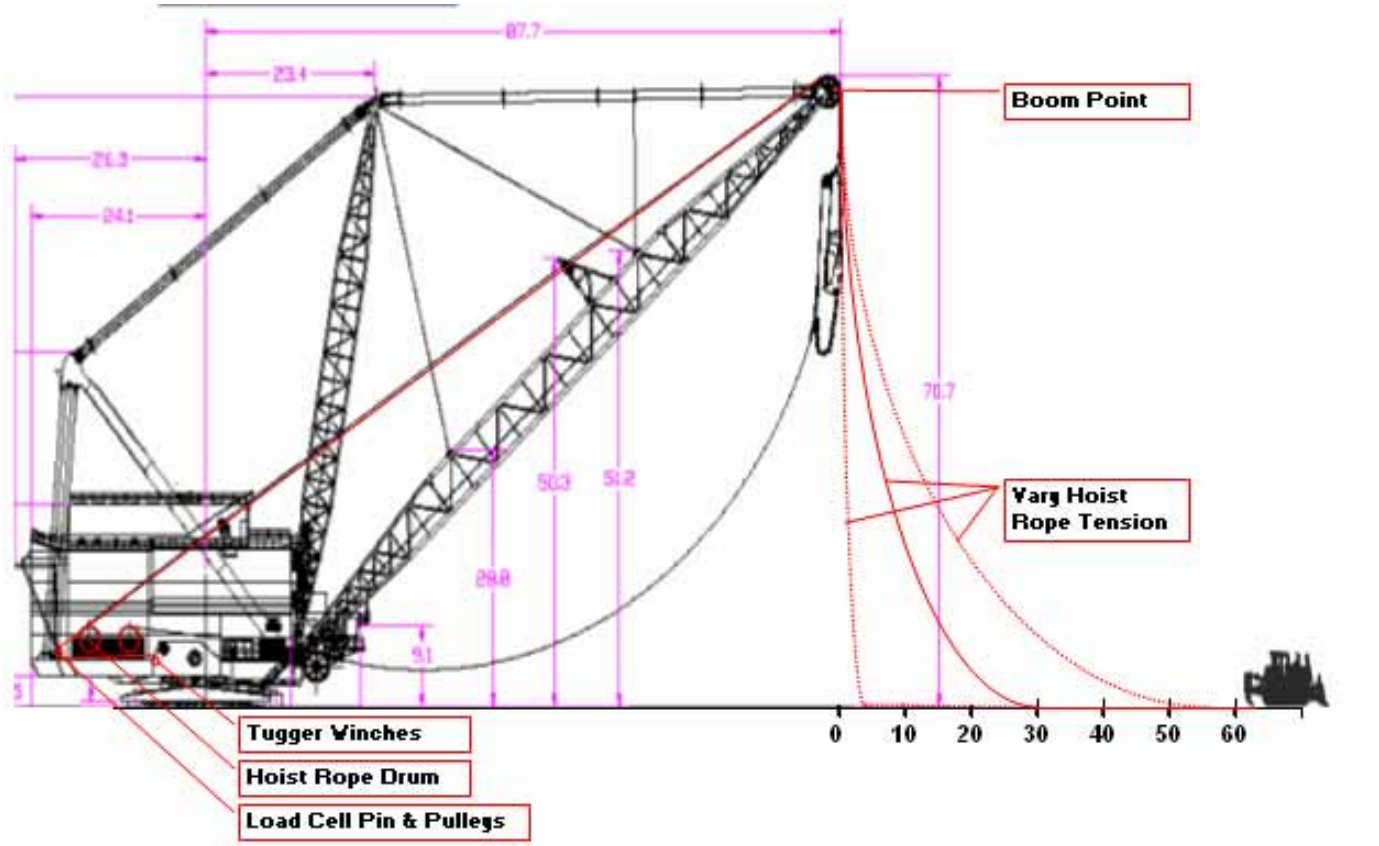
- Commenced operation in 2003
- Open cut, dragline and truck/shovel operation
- Producing coking coal for export markets
- Capacity of 8 million tonnes
- 330 employees
- Key focus on safety – journey to zero

The Problem

- 2 x P & H 9020 Draglines on site
- Change out of hoist ropes undertaken every 12 weeks
- Viewed as one of the high risk tasks
- Potential for tugger winch rigging components to fail causing ropes to fall uncontrollably

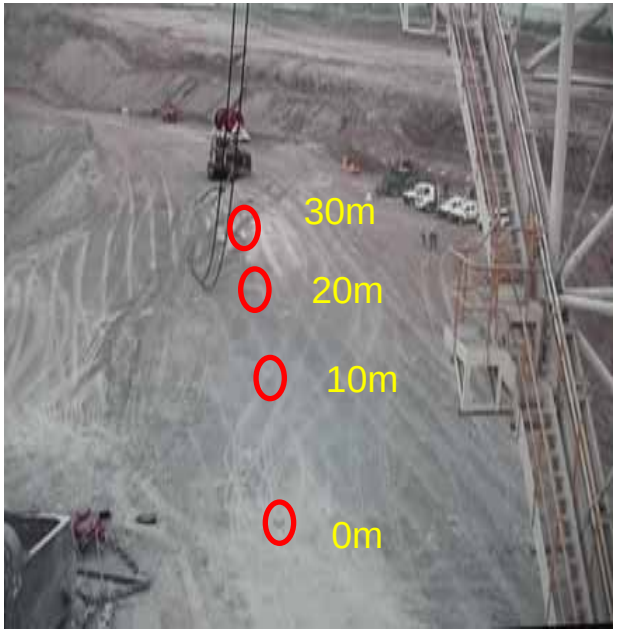
Video

The Problem - Task



Finding a Solution

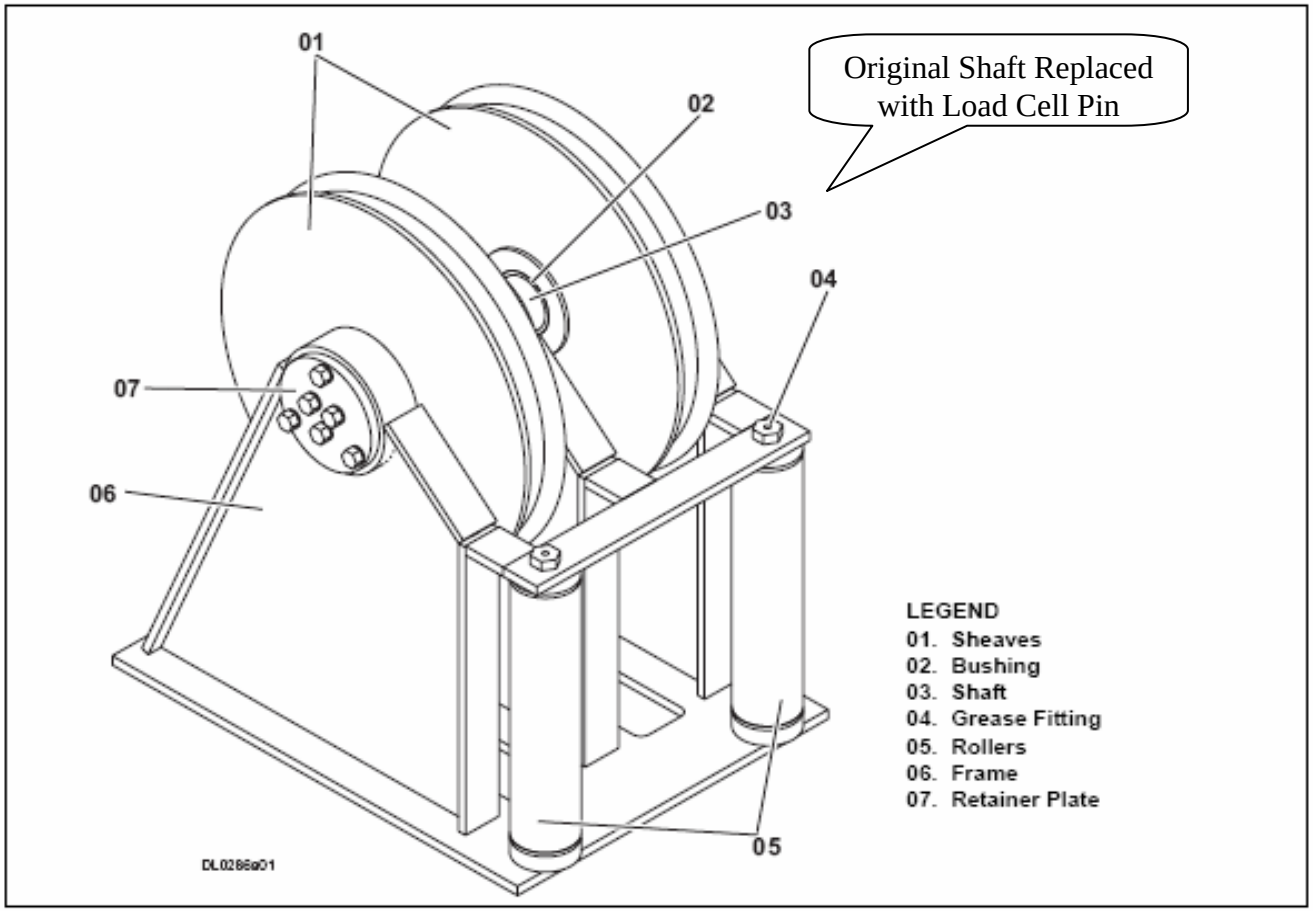
- A review of the current situation and risks was undertaken
- Rope tensions were gauged through experiential procedures
- It was determined a more reliable way to measure winch rope tension was required
- Investigations took place as to how the tension could be measured



The Solution

- Idea to install a load cell pin in the winch pulley sheave and digital read-out to display rope tension
- Specialist company sought to design and manufacture the load cell pin

The Solution



Benefits/ Effects

- Extra control mechanism for Maintainers behind drum to manage tensions in winch ropes
- Maintainers have instant feedback on any tension changes
- Now able to quantify maximum load on winching assembly

Transferability Across Industry

- Innovation applicable to all sites operating draglines

  > removing and installing hoist ropes

  > raising and lowering of booms

- The use of load cells to measure weight of loads required to be reeved would have value in underground operations and on construction sites ie. winders and lifts

- The ability to continuously monitor any reeve loaded components

The Journey to Zero – People are the Key

Questions

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