



DRAGLINE BUCKET AND RIGGING MODELLING

WHY BUCKET AND RIGGING MODELLING?

Making the right decision about bucket type and capacity is essential for efficiency and productivity. The wrong decision can cost both time and money. Modelling is an accurate method of optimising dragline buckets and rigging.

CAN YOU ACCURATELY MODEL BUCKETS AND RIGGING?

Modelling is the only validated way of accurately determining correct bucket capacity to meet target suspended load. Results are normally within the stated accuracy of dragline monitors.

HOW IS MODELLING CONDUCTED?

GBI has developed the techniques for using modelling in commercial decision making and has recently been able to relate modelling results to monitor data.

All scale model test work is conducted in dry, representative spoil, normally obtained from site, sorted to remove blocks larger than 300 mm. The test buckets are accurately scaled and are designed to replicate the full size units in geometry, mass and centre of gravity. Plans of the existing rigging are used to construct rigging for the models, with the aim of preserving scale in geometry and mass.

Testing is conducted with one or more operators from site. All results are included in the analysis as the averages are normalised to field performance (payload vs disengage distance obtained from modelling and disengage distance frequency from monitors). Each cycle involves filling the bucket, swing, dump and return. The analysis is conducted in such a way so that, initially, the modelling can be compared to real results from the field. GBI has a formula for determining optimum bucket capacity to achieve target suspended load.

WHAT MODELLING HAS GBI DONE?

GBI has carried out modelling on 39 different dragline buckets and rigging configurations. The results are illustrated in the bar chart in the following figure. Using the Esco MkIV as a base the chart compares the BER (weight of spoil / volume of bucket capacity) as a percentage for each bucket. It provides a useful comparison of the payload carrying efficiency between buckets of different capacity. This is not in itself enough justification to purchase one specific bucket as can be seen in Figure 2 which is some recent results from field data.

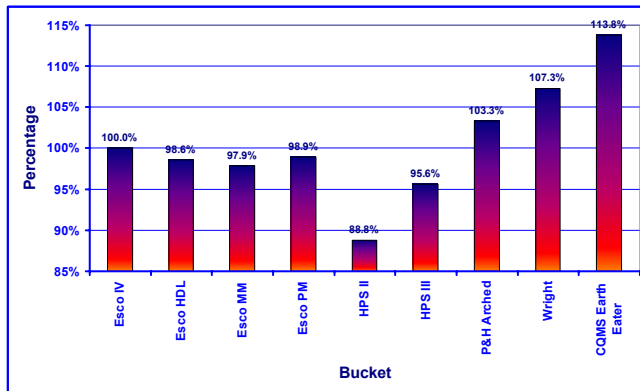


Figure 1 Bucket Comparison from Physical Modelling

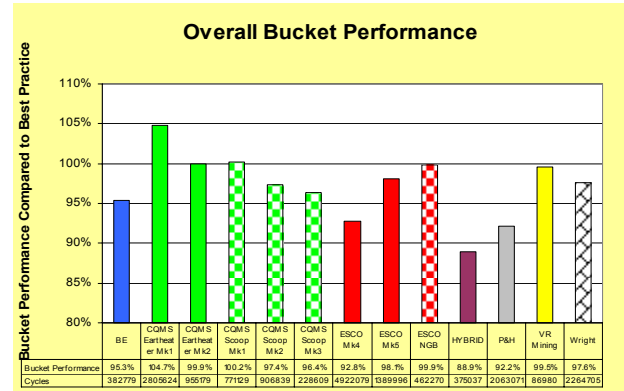


Figure 2 Bucket Comparison from Field Data



WHO USES MODELLING?

The following mines have had physical modelling performed by GBI or GBI employees prior to 1999.

- Newlands
- Hail Creek
- Blair Athol
- Coppabella
- Goonyella / Riverside
- Peak Downs
- Saraji
- German Creek
- Oaky Creek
- Curragh
- Blackwater
- South Blackwater
- Callide
- Tarong
- Howick
- Bulga
- Mount Thorley Warkworth
- Hunter Valley Mine
- Ravensworth
- Narama
- Drayton
- Bengalla
- Ulan
- Sabine (US)
- Cordero Rojo (US)

In addition, two industry wide projects on dragline buckets and rigging, using physical modelling, have been conducted.

BUT MY OPERATION IS DIFFERENT?

We understand that every operation has different requirements. The GBI testing program combines information from minesite monitors and that collected from modelling to arrive at the recommended capacities for each bucket and the projected productivity of each bucket, enabling us to assist you in choosing the right bucket with the right capacity for your operation.

THE GBI DIFFERENCE

With almost 20 years of experience, GBI has more expertise in physical modelling than any other business. As leaders in the field, GBI continues to refine its methods to incorporate monitor data into the process of testing and analysis.

For more information on bucket and rigging modelling please contact Lea Andlovec on 07 31478300 or email Lea.Andlovec@gbimining.com.