

Reducing Total Cost of Ownership of Multi Frequency Sieving Systems



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Introduction

In the production of metal powders used for part production in processes such as metal additive manufacturing and metal injection moulding, the powders need to be sized to ensure they are suitable for the end application.

Powders are most commonly sized, separated into coarse, fine, or intermediate fractions, using sieving systems. The primary cost of sieving systems is the consumption of meshes, which are the medium that divides the powder.



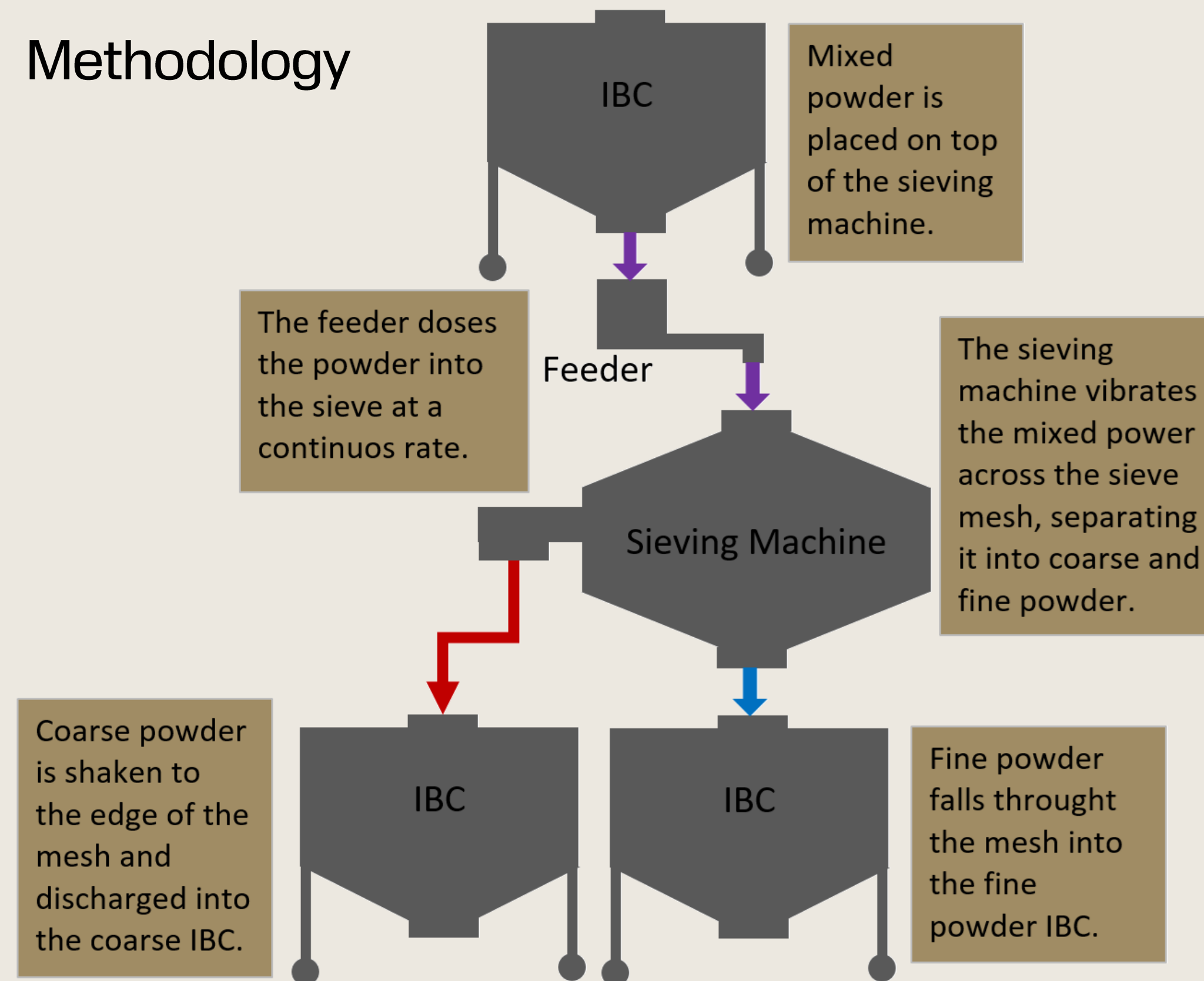
Compact Sieve (Russell Finex, 2023)

Project Aim

To reduce the total cost of ownership (TCO) of multi frequency sieving systems by reducing high running costs.

$$TCO = Equipment\ Cost + (Annual\ Running\ Cost \times Life\ Expectancy)$$

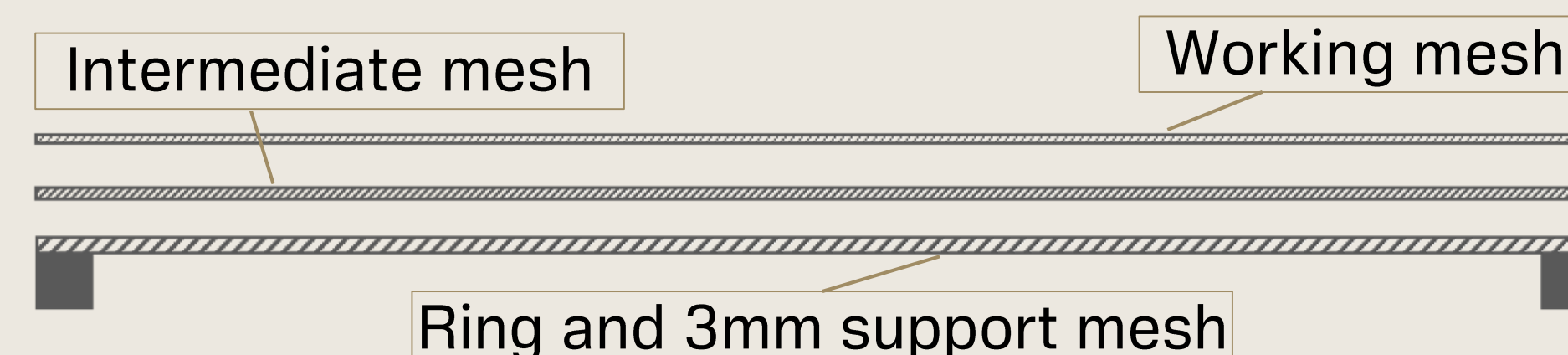
Methodology



Through investigation it was found that the de-blinding assembly was causing wear on the meshes, causing them to fail prematurely.

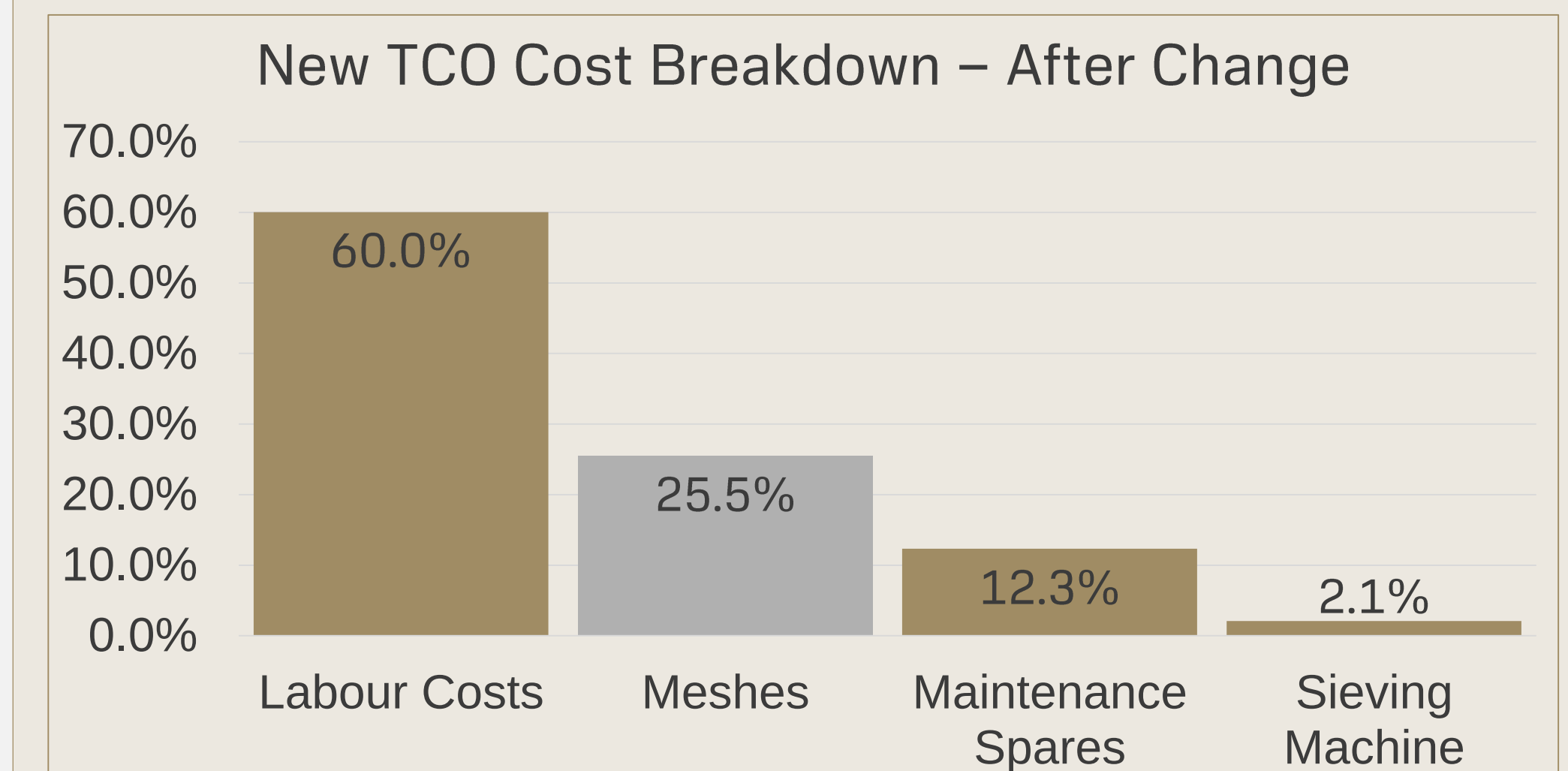
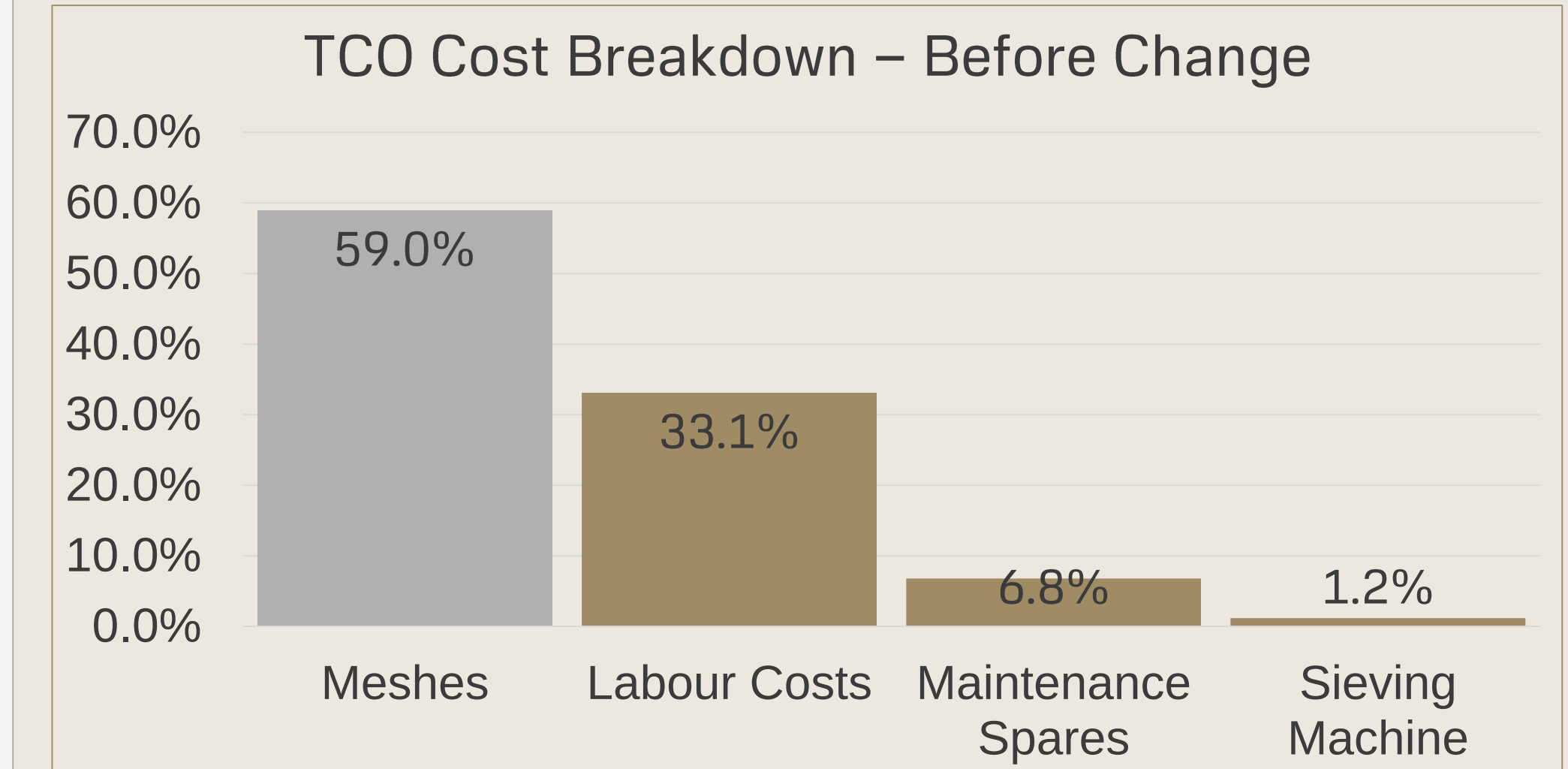


A number of setups were trialled, leading to the introduction of Nylon intermediate meshes under the working mesh, which are more abrasion resistant.



Results

Introduction of Nylon intermediate meshes **reduced the TCO by 55%**, inclusive of the cost of the Nylon mesh, making labour the highest cost at 60% of the new TCO.



Conclusions & Further Work

Minimal additions to the production process.

Nylon working mesh caused inclusions, but improved mesh life. However it had the worst sieving efficiency.

Alternative synthetic meshes could offer further improvements.

Improved maintenance of the sieving machine reduced blinding, which could improve mesh life further.

Motor frequency control could reduce mesh wear by two thirds. This needs proving with a full trial.

More accurate meshes could improve sieving efficiency, trials could be done.