Six Sigma Project

Case Study

Reduction of Bag weight variation of fertilizers in the bagging plant.

TQMI
QUALITY FOR HUMANITY

The Company

A traditional Chemical organisation, with more than four decades of operation in South India engaged in manufacture of >4000 TPD fertilizers.

The Problem

The company has weight variation in the bags of fertilizers in bagging plant due to which they bag excess weight/bag to the tune of 100 gms/bag or short weight leading to customer complaints. The company has Small group activities (QC Circles). Through the QC Circle activities, it could reduce excess weight of fertilizers in the bags from >300 gms/bag to around 100 gm/bag. Further reduction could not be brought in. Hence through Six Sigma approach, they wanted to reduce further to 30gm/bag.

The Approach

Define-Measure- Analyse -Improve-Control methodology was used to solve the problem. The target taken was to reduce % of Overweight bags and Under weight bags by 50% from the current level of performance.

By brainstorming, they identified around 34 factors out of which 21 were prioritized and selected for analysing.

During Root cause analysis , the team initially concluded that due to nature of the product, they cannot improve. But the question was differently asked as “with the given product, which part of their Bagging system is not allowing the control of bag weight variation”.

In this they identified 9 Root causes for which they decided to bring improvement in Material flow, Gravity feeder, Weigh hopper, Controller and PLC Interlocks by totally modernising the year long established Bagging plant.

As a pilot, the team decided to implement solution in one bagging machine at a cost of around 10 lacs..

After implementing the solution, the results obtained was more than what they targeted.

To sustain the benefits, Mistake proofing devices introduced, all the bagging machine controllers software updated and Preventive machine schedule redesigned for bagging machines.

The Result

The company achieved a reduction of more than 50% in excess weight. Process capability improved from 0.023 to 1.18.

Monetary savings was to the tune of 12.5 lacs/annum per bagging machine.

The Management approved to carry out the modifications in all the bagging machines in all the 3 units. A detailed roll out plan has been prepared for horizontal deployment.

The team Leader and the Unit head were surprised to know that Six Sigma methodology had forced to surface out some of the causes which they didn’t imagine in the past around 8 years.

At a Glance

Customer

- **4 decade old company**
- **Manufacturer of fertilizers**

Problem

- **Excess weight per bag**
- **Customer complaints due to short weight per bag.**

Solution

- **DMAIC Methodology adopted**
- **Modified the Bagging machine**
- **Mistake proofing interlocks/devices installed.**

Outcome

- **Reduction of weight variation by more than 50%**
- **Sense of achievement**
- **Management approved to redesign all the bagging machines in all the units.**

“The bag weight variation was brought under control through the systematic Six Sigma approach and with the support of TQMI”