Global Pharma Networks

Case Study
Operational Improvement

Client: Secondary Pharmaceutical Manufacturing Plant

Background:
Our client was a manufacturer of secondary pharmaceutical products. The subsidiary in question was one of several subsidiaries within the country. Their packing operations were experiencing poor 'Overall Equipment Effectiveness' (OEE) performance and there was an urgent need to increase output to achieve quarterly targets. There was a need to raise the OEE from 35/37% to approximately 44/45%. This meant raising OEE approximately 5/10% over the period of 1 month to deliver the quarterly target and the subsequent targets going forward. There were several issues that were lowering the OEE performance of the packing operations.
These issues included

- Poorly documented machine settings leading to slow start-ups after changeovers.
- Poor quality intermediates being supplied from previous workcentres causing high level of unplanned downtime and low yields
- Equipment failures on line causing unplanned downtime.

Scope of work:
The scope of work that GPN undertook to carry out was to

- Assess current performance of the packing line and identify the major opportunities for improvement in the short term.
- Identify the root causes of the key improvement areas.
- Implement the improvements
- Develop an ongoing plan to prevent re-occurrence.

Process:
The initial phase of this assignment was to assess and quantify the potential opportunities that were open to the organisation. This was undertaken by assessing the current OEE data available and identifying the top causes of OEE losses.
Based on this assessment we identified that

1. The indexing mechanism was the major cause of unplanned downtime on the line.
2. The quality of incoming material to the line was causing approximately 25/30% yield losses on certain key products

Following the assessment and approval of management GPN implemented a 2-month programme to resolve these two issues.

Indexing Issue:
Within the organisation there numerous theories on the cause of the indexing issue on line. These included

- The machine is not capable of achieving the control!

- The packing material is unstable and not capable of the required performance at the operating parameters!
- The operators do not know how to set up the machine!
- The maintenance staff is not able to maintain the machine or set it up correctly!
- The maintenance staff has insufficient training!
- There is variability between batches of the packing materials!

One of the key things we identified was that there was no systematic approach to problem solving. This resulted in key information being overlooked. Two key pieces of information had been identified but were not being acted on.

- The packing line did not have this indexing issue 6 months previously
- Other parts of the indexing mechanism were starting to fail on a regular basis.

This indicated that the process had changed over the last 4 to 6 months and this lead us to systematically investigate each of the above theories with a structured problem solving methodology. As part of this we

- Undertook extensive measurement of the packing material to assess variability
- Met with the material vendor to verify that the packing materials were capable of performing under the operating conditions.
- Systematically observing the failure mechanisms on line as they occurred
- Reviewed the Preventative Maintenance regime on the line

The result of this was that we eliminated the above theories and identified that the preventative maintenance regime was not robust enough and this coupled with new technical staff was resulting in areas of the machine being checked.
The indexing issued root cause was identified as a ceased bearing on an idle roller that was putting excessive tension on the packing materials causing the indexing length to vary outside the machine capability.

Poor Quality Incoming Material
The other major OEE loss on line was the high level of rejects on certain key products. Analysis of the defects causing these rejects indicated that the defects could not have been caused on the packing line. Again we applied root cause analysis to the defects and identified the failure mechanism for the product. Our investigation indicated when the failures were occurring but did not indicate how it was taking place.

To identify how the failure mechanism occurred we devised a series of observation experiments to be carried out while the product was being manufactured in the previous work centre. During the course of observing 3 batches of product being produced we identified the failure mechanism and modified the process to eliminate it.

This reduced the yield loss on these particular products from 30% to 10%.
As part of resolving this issue GPN identified

- Improved process controls that would prevent defective products being produced across all product within the family
- Equipment modifications that would prevent defect generation
- Raised the level of process understanding and capability within the technical resources

- Implemented improved preventative maintenance processes that eliminated variability in machine settings resulting in defective product.

Result:

Within the timescale of 2 months the OEE figure for the line was raised to 45/50% on average and reached as high as 55% on certain products. This provided the line with the capability to produce approximately 1.5m additional units per month. These products had a standard cost of approximately 30 cent per unit and this equated to an additional Eur450k of recovered cost per month.

In addition the yield improvements of approximately 20% meant that on the product in question approximately 190k additional units per batch were produced. At standard cost this equated to Eur58k of product being recovered. Over the batches that GPN observed this amounted to approximately Eur170k of recovered product.

With these improvements the company has met its annual targets in terms of product delivered and achieved its entire product launches on time. It has also set up its ability to achieve the 2005 goals.