Setup Time Reduction in Sleeve Cell Using Lean Concepts

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Abstract:
Existing customer-driven market scenario demands low quantity and high variety parts. In achieving the targets lean concepts adaptation plays a major role. Just-in-Time manufacturing method can be adopted for smaller lots production which also results in more set up times with non-value added activity. Hence, the focus of companies in being competitive should be on reducing setup times and eliminating 7 deadly wastes in process.

In this project, setup time evaluation was carried out in milling machine for sleeve cell process. The milling machine was found as the bottle neck operation by studying the process in detail. Pareto analysis was done which identified 3 major causes of high setup time which were design and manufacture of receiver gauge, locator and mandrel change parameter and inspection. These were focused on priority. Corrective actions were taken systematically to reduce the setup time like material movement of trolley, SOP of milling machine for simplifying the setting procedure, 5S, pull production and kaizen activities were initiated in the process. Tools used for achieving these goals were SMED, VSM, Why-Why analysis, 5S, PQ analysis, etc.

The project also focused on reduction of manufacturing lead time for sleeve component. The reduction of manufacturing lead time was bought into action by reducing the cycle time of the sleeve cell. The implementation of project led to reduction of setup time from 122 minutes to 38 minutes, and manufacturing lead time reduction by 4 days to 1.2 days. Total inventory was reduced by 80%. Manpower was reduced from 5 associates to 4 associates. Results were validated with comparative study.

Existing changeover vs target
Process capacity sheet
PQ analysis chart
Reduction in change over-time