

# Cutting Production Lead Times to boost efficiency and productivity

Italian client belonging to a leading international aeronautical engine manufacturing group. Company with over 300 employees and a total annual turnover in excess of € 40,000,000.

The process analysed, particularly innovative and technological, regarded the Investment Casting Manufacturing area, which given the operating context, has a strong bearing on the quality of the finished product.

## Context

The aim of the project was to cut production lead time, thus boosting profit margins and competitiveness.

Specifically, in a context where high levels of quality are required and where production times are calculated as the sum of all the man hours for the individual processes that make up the main manufacturing cycle, the target was to cut average production time by 12%, with a view to boosting process efficiency and thus productivity, with the same resources.

The context (project ring) the work group encountered can be summarily illustrated by the following figures:

- ~ 160.000 units processed in a year
- 3 different types of product
- current average production time: more than 300 minutes.

## Project

The project was developed in 2012-13, alternating periods of training with practical project implementation on the part of the work group.

This parallel classroom and on-the-job training program was conducted by a work group comprising 6 company Green Belts in training with the Process Owner and the Sponsor. In addition, the team was broadened to guarantee IT support, bringing in a number of specialised figures for process data collection and processing and for a feasibility and cost estimated regarding some of the proposals presented in the Action Plan.

The traditional LSS-DMAIC approach was adopted, organised into 5 stages - Define, Measure, Analyse, Improve and Control - during which the work team applied lean skills and in-depth statistical analysis, also using software tools such as Minitab.

The work group entrusted to PRAXI consultants was managed using project management tools (Gantt, WBS, etc.), as well as others geared towards providing guidelines and facilitating teamwork.

## Results

Once a plan was defined for collecting data (mostly field data) on the three different types of products, the typical values of the process were measured, >>>



*improving performance*

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as specific variables linked to the large variety of detailed processes, the level of manufacturing complexity, and the times required for processing and handling, as well as waiting and set-up times in between.

Breaking down the activities subsequently made it possible to distinguish those that create added value and those that do **not** (the time spent on the latter, linked with set-up, handling and transport, should be cut to a minimum); a comparative analysis was also conducted among operators, based on individual skills, to assess any potential impact on process performance.

For each of the three types of products analysed, it emerged that the operator's experience plays a key role: the higher the level of experiential training, the less time processes take at the finishing stage (for the same product quality). Bringing experience to the same level would thus not only save time, but would also reposition process performance within the desired levels.

Cycle times and the volumes of individual processing stages were also analysed, with a view to identifying a new sequence of operations.

The improvement actions proposed thus included a training programme, with younger operators being tutored by more expert colleagues. An organisational change was also suggested, comprising a higher degree of job rotation, and reference master plans were created to uniform operations during the finishing and visual inspection stages.

It is estimated that the actions introduced could cut LEAD TIME by 41%, 29% and 10% respectively for the three product types, with savings of approx. € 80,000 per year.

## Future developments

Once the action plan has been submitted to the Process Owner and the Sponsor, the work group will be entrusted with implementing the proposals, using the Improvement/Control plan set out.

The first results, in terms of cutting process times, will be evident two months on from the implementation of the improvement actions identified.

In addition, this project has allowed for the introduction of the kaizen approach, promoting a corporate culture aimed at guaranteeing a series of continuous improvements to processes (through specific actions lasting 3-5 days), which not only reduces processing times but ultimately improves both working conditions for operators and product quality.