**Improve Turnaround Time by Reducing Backlog**

**Industry:** Manufacturing  
**Company Type:** International Airliner  
**Project Title:** Improve Turnaround Time by Reducing Backlog  
**Method Used:** Juran’s Black Belt Six Sigma DMAIC Process and Project Coaching; Statistical Product and Process Control  
**Project Timeline:** Eight months  
**Total Savings:** 50% reduction in cycle time in pilot project; new stable, measurable, and in-control processes; results are repeatable and reproducible and will be implemented in all component maintenance facilities across the board. As the project implementation continues, new opportunities for significant improvement where Six Sigma can be deployed have been uncovered. Ongoing return on investment (ROI), with financial impact estimated to be millions.

**Problem Statement:** Internal Turnaround Time was not competitive with external Maintenance, Repair, and Overhaul (MRO) facilities. The data collected on the internal facilities, showed that there was no discernable systematic process followed, resulting in a fast growing list of open work orders. Queue time of components was not controlled, causing excessive backlog.

- **Backlog** is defined as all components and sub-assemblies that are in the shop but not unserviceable at the time they are there, for a longer than expected period of time.  
- **Component Maintenance** looks at open work orders to account for backlog.

**Project Goal:**  
- Develop and Implement a controlled process for queue time in one shop (problems and causes were similar across different shops) and replicate across the board.  
- Reduce average cycle time by a minimum of 50% (from an average of 21 days to an average of 10 days).

**Business Case:** In one year, the volume of backlog component maintenance amounted to $261M. Backlog has a huge impact on the different component shops, creating space constraints, low visibility of inventory and open orders, and rework cycles which added to the difficulty in prioritizing and scheduling. In some cases, flights were delayed or had to be cancelled because due dates were missed.

To try and keep up with the schedule, more overtime had to be worked, amounting to $2.4M in a year, and on average, an inventory depreciation of $32K a day.

As a result, new contracts had to be turned away.

**Project:** Some proven root causes for which solutions were developed were:

1. Queue time measurements were inconsistent – standard definitions were developed and a rating system to identify priority was implemented. Data was collected at pre-determined points to measure queue time consistently.
2. There were many different processes developed by different component shops - in some cases people were not aware of the process, and in other cases, the process was not well defined – processes were documented and standardized across shops.

3. Incorrect paperwork with units causing delays – a new system was implemented to ensure accurate work orders accompanied incoming units.

4. All units on the daily log were scheduled to be worked on – first in - first out was not practiced – this has been corrected with the planners using the prioritization system.

5. Active backlog reduction was practiced – this is tracked weekly and escalation procedures were developed and implemented.

6. Accountability and follow up were not defined – ownership and accountability for the end to end process was established.

**Sustaining the Gains:** Statistical Process Control and Control Charting was developed and implemented.

A control plan identifying and defining key process measurements and frequency of measurement enabled visibility and accuracy of how the process was performing. Out of control conditions were clearly identified, and data collected and updated in a control chart acted as an early warning system to process owners for when to take appropriate action.

Specific corrective actions had to be taken when out of control conditions were occurring. One point of accountability was a key factor for success, and escalation procedures were mapped and implemented to ensure the process was monitored accurately and could be brought back under control in the shortest possible time.

**Results:**
Lessons learned included:

1. The Company had to become more sensitized to the requirement of relying on accurate and timely data; therefore more emphasis had to be placed on data collection and retrieval.
2. Use of data and how this relates to the strategic direction of the company to drive project decisions.
3. Translating Six Sigma tools and concepts into world class performance moves faster where business units understand and support the Six Sigma Methodology.
4. Six Sigma is a complement to current improvement initiatives like LEAN.
5. The tools we learned will help to bring many ideas to fruition.

**FOR MORE INFORMATION:**
For more information on how we can help your organization attain sustainable results, please contact us at 800.338.7726, or visit us on the web at [www.juran.com](http://www.juran.com).