



## Case Study

# CNC Milling Machine Automotive

## Business Need

The client is a manufacturer of parts for the automotive industry. One machine on the production line was causing a backlog in production, due to repeat failures. The machine

was a single point of failure. A discussion was held with site management to determine a strategy of action which would improve the current situation.

## Solution

The decision to either perform a Root Cause Analysis on the failures or to run a Reliability Centred Maintenance study on the machine was discussed. It was agreed that maintenance plans were insufficient and not well executed through a formal planning and scheduling process. It was therefore decided to run the RCM study to determine the optimum maintenance program including a review of the daily TPM (Total Productive Manufacturing) activities.

An improvement team made up of a mechanical, production and process engineer were brought together to perform the study.

The process began first with the development of an equipment hierarchy which was not current in the companies CMMS system. All current maintenance activity and failure reporting was being captured at

production line level. Once the equipment hierarchy was built, it was followed with a failure mode and effects analysis (FMEA) that identified the failure modes of the machine. The team then examined each failure mode to determine the optimum maintenance policy to reduce the severity impact of each failure.

The chosen maintenance strategy considered the cost, safety, environmental and operational consequences. The effects of redundancy, spares costs, maintenance crew costs, equipment ageing, and repair times were also considered.

Once the optimal maintenance policies had been identified within the RCM process, the team were then able to see the performance predictions and costs, expected spares requirements and maintenance crew manning levels.

## Results

The optimised maintenance strategy was also used to determine several outputs including:

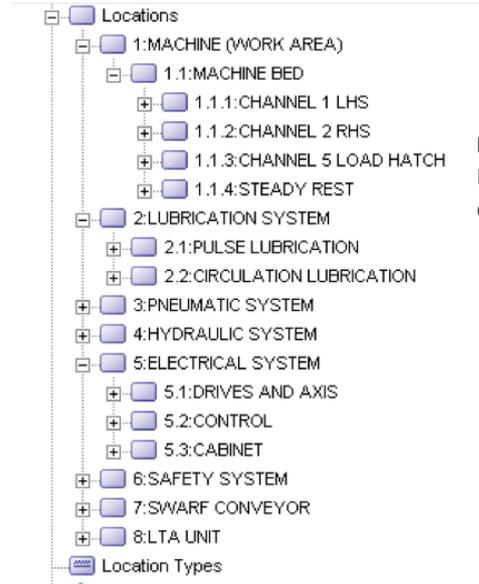
- Maintenance Strategy Comparison
- FMECA Summary
- Maintenance Plan

## Conclusion

The implementation of the recommended maintenance strategy will reduce business effects by minimising losses to production through unplanned outages and increase plant availability.

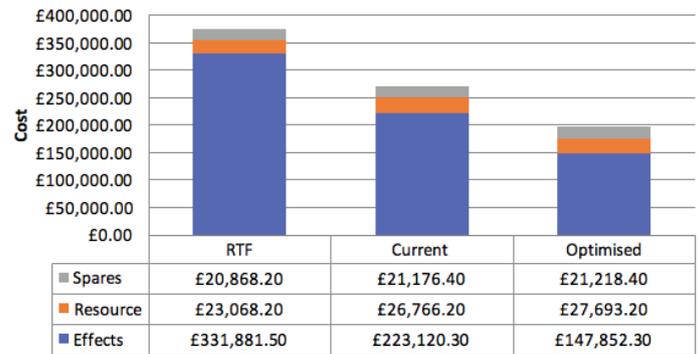
With a combination of simple methodologies and practical training delivery, Pro-Reliability Solutions support Asset and Continuous Improvement Managers to proactively manage their assets and ensure their equipment delivers the required level of availability while minimising risks to the business. Whether it is a new project in the design phase or an existing facility that needs improvement, Pro-Reliability Solutions can help customers realise bottom-line results.

This Reliability Study was performed using Isograph Availability Workbench Software.



**Fig 1**  
Machine Hierarchy developed for the study

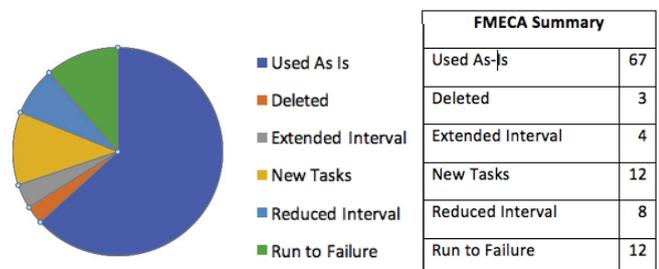
## Average Annual Cost Comparison -CNC Machine



**Fig 2** – Strategy comparison

## FMECA Summary

The FMECA study analysed 106 failure modes of the CNC Machine. The summary of those failure modes and associated tasks can be seen in the table and pie chart below. The FMECA also identified 29 areas of redesign some of which were just further investigation required.



**Fig 3** – FMECA Summary