

Off-Set Printing Case Study- Efficiency Review

[Conducted on behalf of a Large Australian Printing Company]

Sydney NSW 2046, Australia

“Excerpt of a review on printing press operational effectiveness – Processes and Productivity”

EXECUTIVE OVERVIEW

Project Scope – To review Operational Effectiveness in terms of printing processes and plant productivity within the Printing Department of a large Australian Printing Company¹.

Management is becoming increasingly concerned about the level of customer complaints which have “increased considerably” in recent times. As the contract for the core product line is up for contract renewal within the next 18 month the concern is that if the issues identified are not addressed then the business will be placed in a vulnerable position.

Based upon the review of data provided, it is clear that management must take immediate actions to address the causes of failure identified in this report. In particular these issues pertain to process and productivity issues which are affecting operational performance.

Processes – Significant opportunity exists to reduce variation by working more closely with the organisation’s suppliers. Whilst most staff had an opinion of the issues affecting performance no effective data existed prior to this review. By this I mean that production data is available in the form of supervisor run reports but until our staff collated this data there was no quantifiable and factual data from which

to make sound management decisions. Furthermore there are no internal measurement systems in place to assess the quality and consistency of the raw materials used within the printing area. No evidence of Review Meetings with key paper, ink and plate suppliers could be produced and we believe that this is directly contributing to a lack of focus from these suppliers.

This failure to measure against the published product specifications is directly translating into stoppages, reduced quality and downtime. The data analysed to date shows a significant increase in overall stoppages on the presses which can be attributed to quality causes. When comparing the current year to the prior year there has been an increase in press stoppages of 101.9%.

DETAILED ANALYSIS

A Pareto analysis² was used to identify the top 20% of reasons which resulted in stoppages of the presses and therefore impacted output.

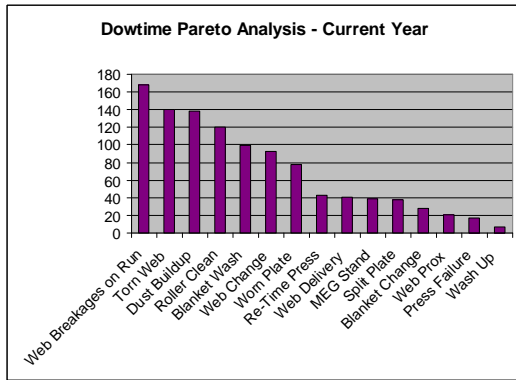
A review of the causes of these stoppages was undertaken in some detail, contrasting causes over a two year campaign period. There were 15 common causes of process stoppages (Chart 1) with the top three being; Web Breaks on Run (Strength), Torn Web

¹ Company name omitted for privacy reasons

² John M^cConnell, “The Seven Tools of TQC”, Quantum House Limited

(Supplier Process Issues) and Dust Build-up on Sensors (Paper Quality).

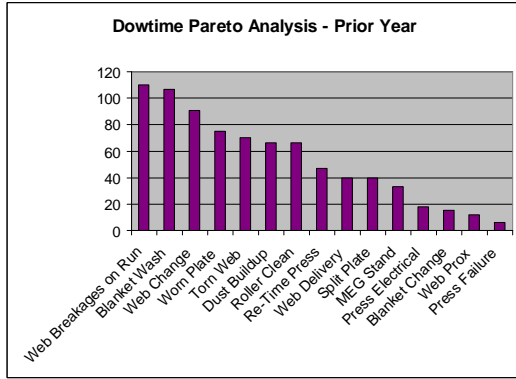
Chart 1



These three causes of failure occurred 444 times during the current three month campaign run and resulted in some 284 hours of press downtime. Subsequent analysis shows that each downtime cause was the result of “off specification product”.

The most notable result of this analysis is that total stoppages for the three month campaign, when contrasted against the previous year’s campaign data (Chart 2) reveals that there has been a 101.9% increase in stoppages on the presses.

Chart 2



To further understand whether the issues were representative across all printing presses, the review was then

disseminated to assess the two main presses used in both campaign runs.

For ease and relevance of the data presentation, (due to the smaller sample size) the number of stoppage categories has been reduced from 15 to 11. This in no way adversely affects the data presented as the categories removed were in the tail.

When analysing the data for Press 1 in the periods under review, (Chart 3 and 4) there was an increase in downtime stoppages on this press of 118.6% for the current year.

Chart 3

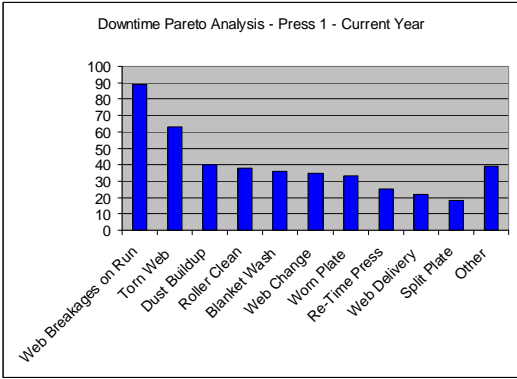
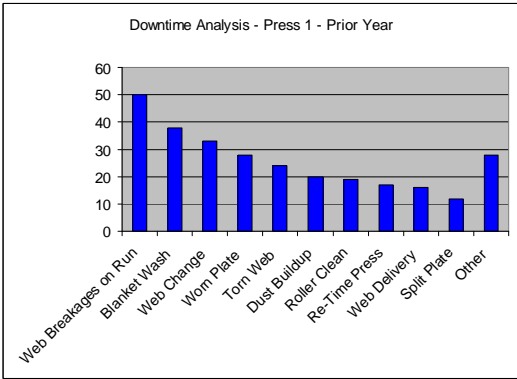


Chart 4



When analysing the data for Press 2, (Chart 5 & 6) there was an increase of 93.6% in overall downtime stoppages for this press when contrasting both years.

Chart 5

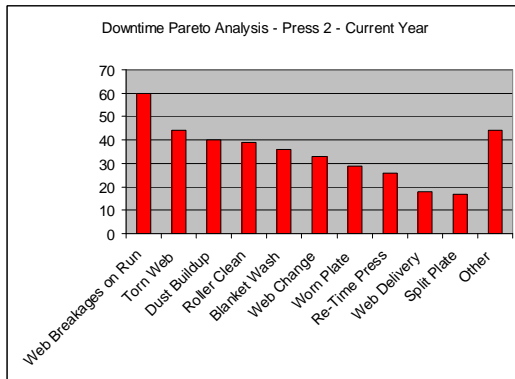
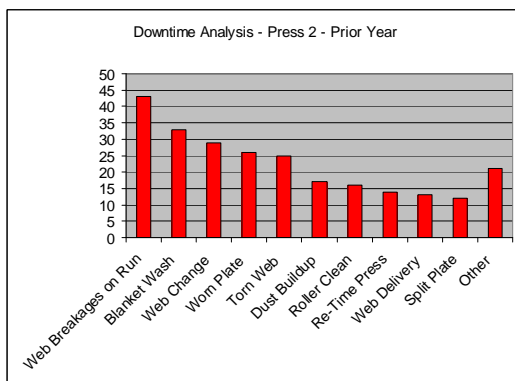


Chart 6



It is clear that the issues affecting overall printing press efficiency and effectiveness are not machine dependant. There is no discernable difference between stoppages which occurred on Press one to those which occurred on press two.

Certainly what is obvious is the significant increase in stoppages across the two year period.

Note: Detailed data of all evaluations for downtime stoppage causes in the Printing Department, i.e. Frequency of Occurrence and Hours of Lost Production are summarised for the reader in Appendix 3 (3.3.1 – 3.3.28).

PROCESS

When reviewing the information provided there are clear indications that

certain categories are the key causes of process ineffectiveness.

Of data evaluated pertaining to processes stoppages; Web Breaks on Run, Torn Web, Dust Build-up and Roller Clean can all be linked to raw material quality. Further investigation of potential causes which resulted from departmental brainstorming sessions identifies the following:

- Web breaks are caused by the variable tensile strength of the web;
- That torn web is the result of ineffective quality processes at the supplier;
- That dust build up is the resultant of poor quality paper;
- Other causes of web breaks were reel splice joins and poorly wound reels which are each the result of poor supplier quality.

It is clear that measurement processes must be put in place to measure supplier performance to standard. Key measures such as tensile strength, shrinkage, elongation, joins per 100 metres, and moisture content need to occur using X Bar & R Charts due to the data being of a continuous nature. With this measured data line operators will be able to determine whether a process is within control and in turn whether action needs to be taken.

The use of Histograms and Process Capability Charts in turn will provide an understanding of the supplier’s product performance by showing the variation of the process against specifications. By working closely with the key raw material suppliers, by setting specification limits and through ensuring they implement their own process

measurement systems one can reasonably expect to see a marketed improvement in the performance of the presses.

During the analysis it was found that many reported stoppages were poorly documented and this lack of data has meant that the Cost of Poor Quality (COPQ) has not been identified to date. Ongoing measurements, if implemented will allow for more reliable decisions to be made by staff.

TRAINING RECOMMENDATIONS

Whenever data is collected the fundamental concern is whether the data is accurate and that it truly reflects the situation at hand.

Discussions with Line Managers and key operational staff have highlighted a lack of understanding about the importance of Key Performance Indicators such as Statistical Process Control Charts and CPK Charts etc. A skills gap analysis should be conducted to identify those staff that will benefit from upskilling in this area. Once assessed, individual development plans could be implemented that set out the company's expectations, timeframes and support structures which will be put in place to aid the employees.

With many staff never being exposed to these forms of tools in the past it is recommended that they be training in their use. With a large amount of downtime attributable to the failure to measure, the resultant payback should easily justify the initial up front costs of providing this training.

It should be further noted that due to the "seasonality" of much of the business many employees are casual staff who are let go during quiet times. This is standard practice to a large extent and therefore the challenge here is to ensure that those trained are the ones more likely to be retained.

CLOSING STATEMENT

The department managers have had significant input into the analysis and development of this report and they are to be commended for their enthusiasm to identify and address concerns.

It is heartening to see this positive attitude and I am convinced that with the right tools and leadership direction they will quickly address the areas of most concern. This in turn should see an improvement to the finished quality and ultimately to customer satisfaction levels.