



Benefits of Planned Maintenance - The TPM approach

An analysis of equipment failure & Maintenance costs in 70 TPM practicing companies

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Breakdown forms one of the major losses which carve into machine availability affecting the overall equipment efficiency and productivity in any company. TPM approach has been found to be very effective in preventing the breakdown or achieving “Zero Breakdown” status. A detailed analysis was done by covering around 70 TPM practicing companies from both domestic and overseas. The data covers various segments of industry and the results are summarized in this report. The following KPI’s were covered in the analysis:

- Break down
- Maintenance cost
- MTBF
- MTTR
- Lubrication oil Consumption



In the journey of TPM, specifically with respect to Breakdown; Autonomous Maintenance and Planned Maintenance Pillars work hand in hand. The typical approach that was taken in the first year was on a small number of Machines – “Manager Model Machines” where the TPM possibility in the company was tested. This journey was typically for a period of 6-9 months. Excellent results on the KPI’s were achieved through the application of TPM methodology on the Manager Model Machines. In the first year of the journey, since only critical machines were taken for TPM implementation, only the results of these machines were reflected.

TPM circles which were formed across the company got activated to a larger extent after the successful completion of Manager Model Machine either towards the end of first year or towards the beginning of second year. JH activities on step 1 & 2 were taken up on all the machines. These activities together with activities under PM determined the level of reduction in the breakdowns.

By the end of the second year, very good changes were seen in the companies. Third year showed higher results as most of the machines in the company would be covered. JH step 1, 2, 3 and to some extent step 4 would have been ingrained in the employees. This, together with the good PM pillar activities gave tremendous results on the selected KPI’s.

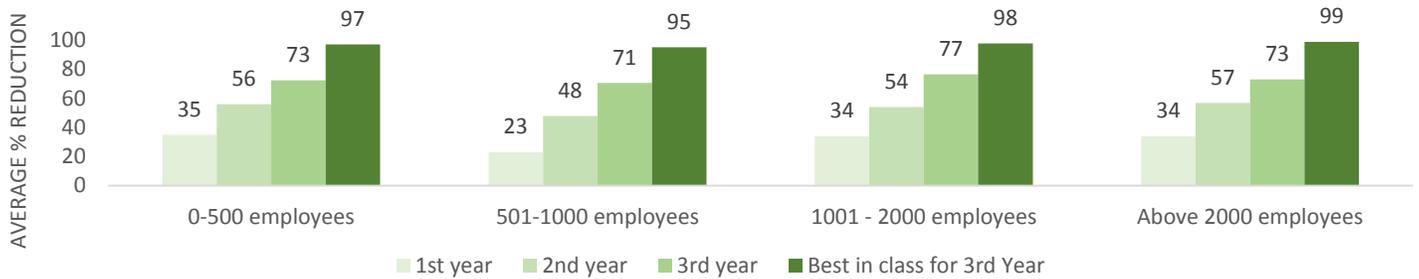
Many of the companies nearly achieved Zero breakdown especially on the A, B rank machines and to a large extent on the C rank machines as well. Breakdown trends for new machines which were brought subsequently saw drastic reduction due to TPM practice at the design stage of the machine itself. In this report we are trying to capture the actual results achieved by the companies so that this can be considered as a benchmark for many companies embarking in the journey of TPM.

The results of breakdown reduction trends based on the below classifications are depicted in the following graphs:

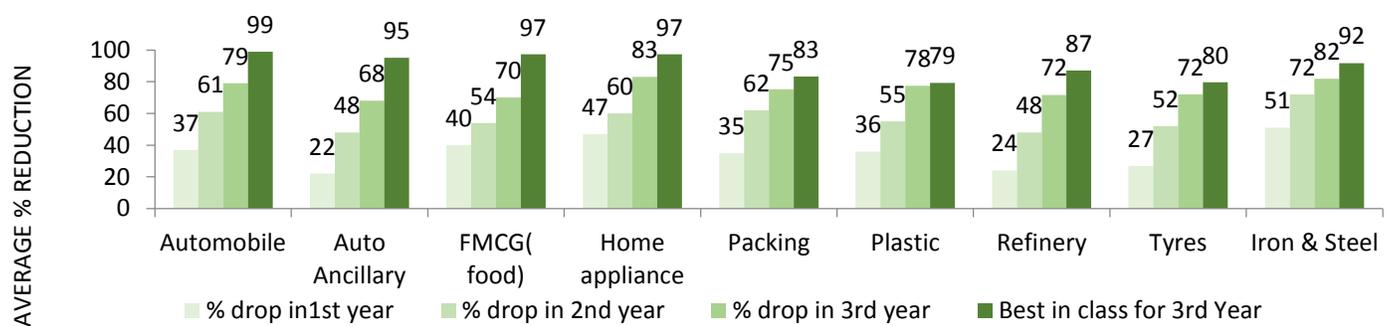
- Number of Employees
- Different sectors
- OEM Vs Ancillary
- Process Vs Engg
- Indian Vs Overseas companies

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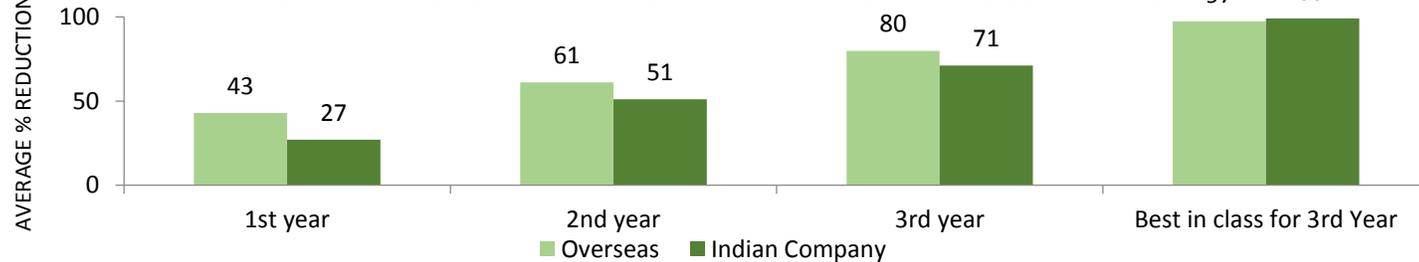
BREAKDOWN REDUCTION TREND- NUMBER OF EMPLOYEE WISE



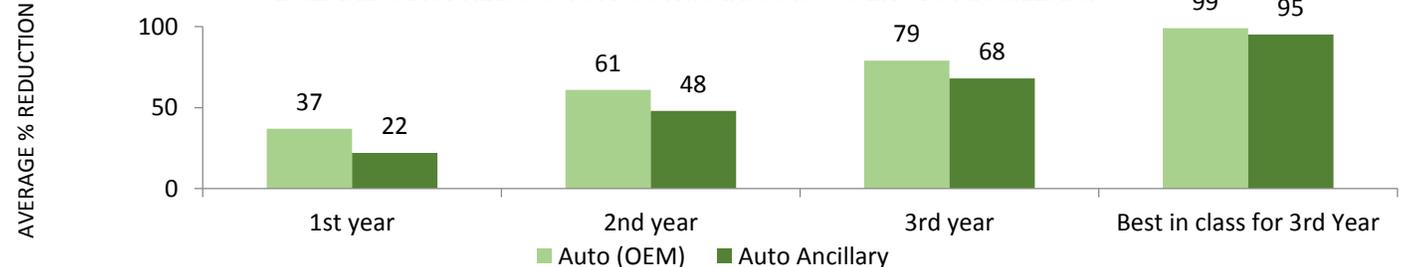
BREAKDOWN REDUCTION TREND- SECTORWISE



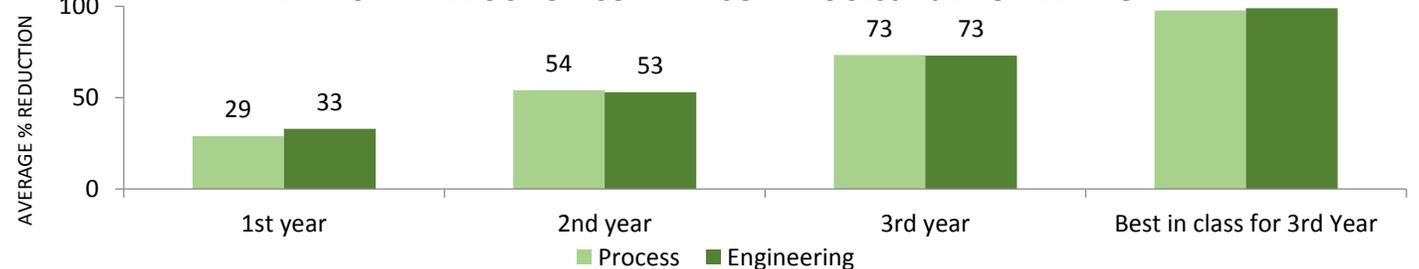
BREAKDOWN REDUCTION COMPARISON INDIAN Vs OVERSEAS COMPANIES



BREAKDOWN REDUCTION COMPARISON – OEM Vs ANCILLARY



BREAKDOWN REDUCTION COMPARISON PROCESS Vs ENGINEERING



Tangible Benefits Achieved: (representative data)

- Breakdown reduction by 80 %
- MTBF increased by 200 %
- Maintenance cost reduction by 35%
- MTTR reduced by 31 %
- Lubrication oil consumption reduced by 40 %
- Lubrication oil cost reduction by 54 %
- Reduction in spare parts consumption.

Intangible Benefits Achieved: (representative data)

- Maintenance personnel become knowledgeable on maintenance techniques such as TBM, CBM etc.
- They have better knowledge on maintenance planning methods
- There was better focus on reducing maintenance cost
- Having achieved ZERO Breakdowns, their confidence levels were high on maintaining the machines
- Maintenance team could do higher level of "Quality of Maintenance"

Conclusion:

From the above data and analysis, we can infer the trend of breakdown in TPM practicing companies.

- It can be seen that there is drop in breakdowns from 25- 40% in the first year of TPM journey. In the initial year, major work is done on the Model machine only.
- As TPM progress companywide we can see an average reduction of 40-60 % in the second year and 70-80 % reduction in the third year.
- We could see a better performance in the OEM segment when compared to the Auto Ancillary. The Auto Ancillary segments need to focus and drive a little more for better and faster results.
- Reduction in breakdown - year on year in the Engineering industry is little more than the process Industry.
- When compared to Indian companies, overseas companies have achieved a higher rate of reduction in breakdowns.

NOTES

1. Today, with competition being all time high, TPM is the most important philosophy that stands for profit enhancement and sustainability. It has been proven to be a program that works. It can be adapted to work not only in industrial plants, but in construction, ports, services, transportation and in a variety of other sectors.
2. Employees must be educated and convinced that TPM is not just another "program of the month" and that management is totally committed to it. Required time frame should be given for full implementation to gain maximum benefits. If everyone involved in the TPM program does their part, an unusually high rate of return compared to resources invested can be expected.
3. TPM is not only a strategy, but a new philosophy of structured continuous improvement programme and team work that creates a sense of ownership across all the employees from Top management to the operator level. All employees become more committed and reach a new level of higher responsibility.

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