



Benefits of **PLANNED MAINTENANCE**

The TPM Approach

*An Analysis of Equipment Failure & Maintenance Costs in 70 TPM
Practicing Companies*

Biju K Raj
Sr. Counsellor - TPM
CII - Institute of Quality



Breakdowns forms one of the major losses which carve into machine availability affecting the overall equipment efficiency. 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 is summarized in this report.

The following KPI's were covered in the analysis



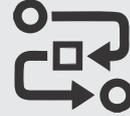
Breakdown



Maintenance
cost



MTBF



MTRR



Lubrication oil
Consumption



In the journey of TPM, specifically with respect to Breakdown, Autonomous Maintenance and Planned maintenance Pillar work hand in hand. The typical approach that is taken in first year is through a small set of Machines – “Manager Model Machines” where the TPM possibility in the company is tested. This journey would be typically for a period of 6-9 months for getting excellent results on the KPI's through the application of TPM methodology.

In the first year of the journey, since only critical machines are taken for TPM implementation, only the results of these machines would be reflected.

During the second year, with the TPM circles formed across the company, JH activities on step 1 & 2 would be taken up on all the machines. These activities together with activities under PM would determine the level of reduction in the breakdowns.

By the end of the second year, very good changes could be seen in a company. Third year shows higher results as all the machines in the company would have been covered. JH step 1, 2, 3 and to some extent step 4 would have been ingrained in the employees of the company. This together with the good PM pillar activities gave tremendous results.

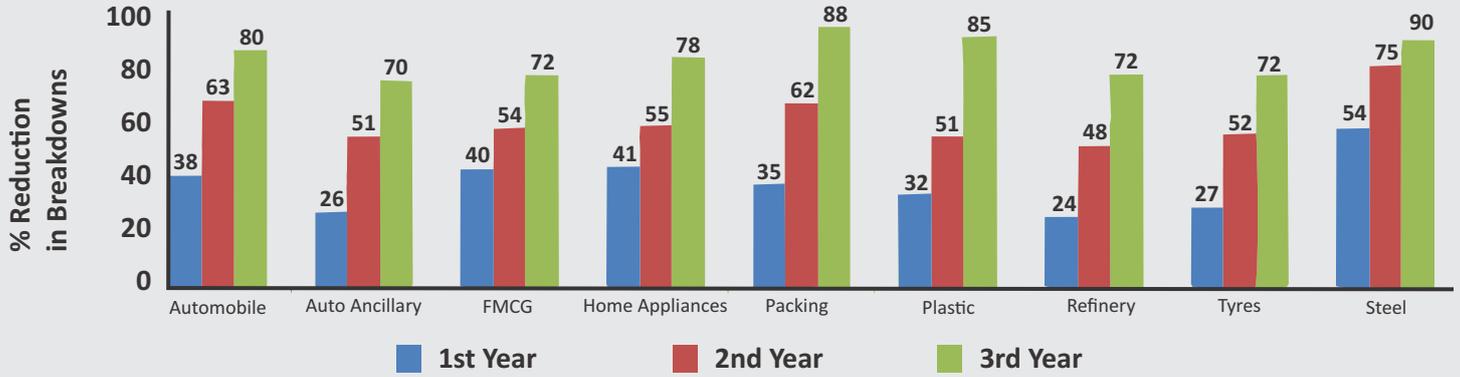
Many of the companies would have achieved Zero breakdown especially on the A, B rank machines and a large extent on the C rank machines. Breakdown trends for new machines which were brought subsequently would typically see drastic reduction due to TPM practice at the design stage of the machine itself.

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.

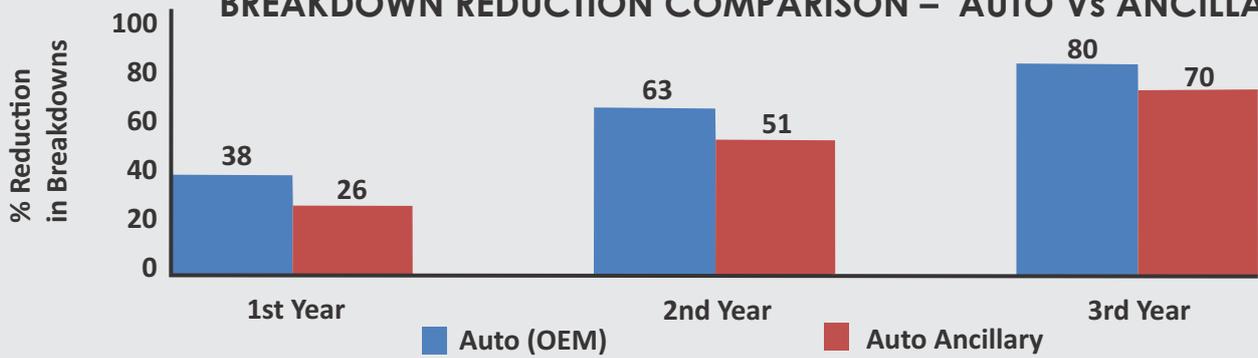
BREAKDOWN REDUCTION TREND- NUMBER OF EMPLOYEE WISE



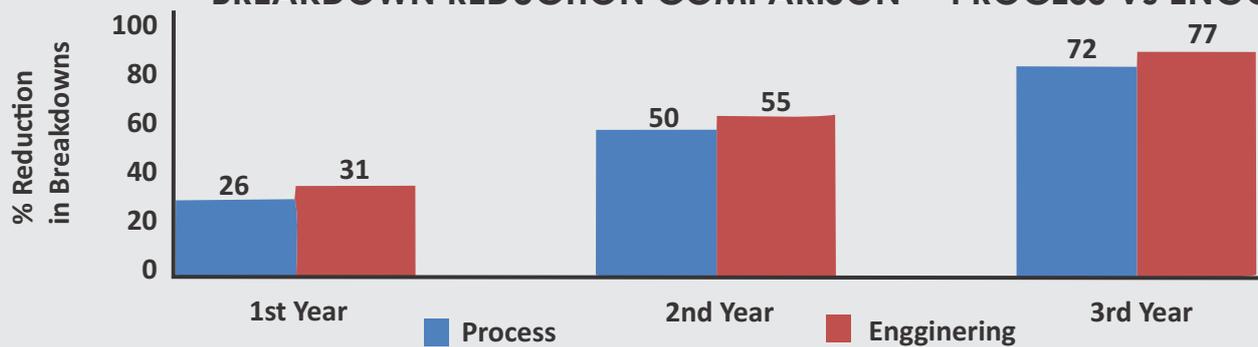
BREAKDOWN REDUCTION TREND- SECTORWISE



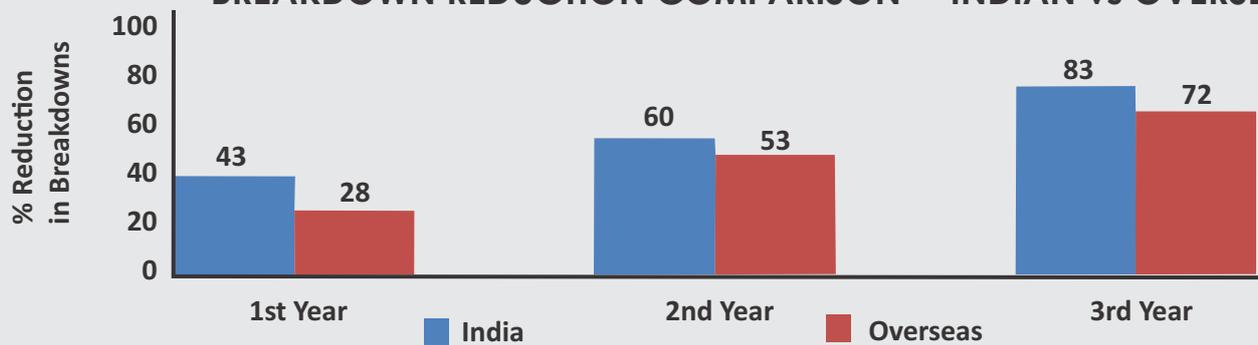
BREAKDOWN REDUCTION COMPARISON – AUTO Vs ANCILLARY



BREAKDOWN REDUCTION COMPARISON – PROCESS Vs ENGG



BREAKDOWN REDUCTION COMPARISON – INDIAN vs OVERSEAS



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 companywide TPM progress 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. This is probably due to the nature of operation.
- When compared to Indian companies, overseas companies have achieved a higher rate of reduction in breakdowns. This could probably be due to higher level of training and skill development for maintenance. Indian companies need to focus on the skill enhancement of the Maintenance personnel.
- 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.
- 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.
- TPM is not only a strategy, but a new philosophy of continuous improvement 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.



Tangible Benefits Achieved *Indicative*

80% Breakdown Reduction

200% MTBF Increased

35% Maintenance Cost reduction

31% MTRR Reduction

40% Lubrication oil consumption reduced

54% Lubrication oil cost reduction

Intangible Benefits Achieved *Indicative*



- Maintenance personnel become knowledgeable on maintenance techniques such as TBM, CBM.
- Has better knowledge on maintenance planning methods
- Has better focus on maintenance cost
- Having achieved ZERO Breakdowns, their confidence levels are high on maintaining the machines
- Can do higher level of "Quality of Maintenance"

TPM is not



A temporary plan to be forgotten later



A machine refurbishing or overhaul service



One more task to perform

On the contrary, TPM is



A culture that arrives to stay



A new way to bring machines up to their optimal condition and maintain them



A practice that makes the job safer, easier, more comfortable and more efficient



A practice to achieve Business Goals

CII TPM CLUB INDIA
CII INSTITUTE OF QUALITY

Near Bharat Nagara, II Phase Magadi Main Road
Vishwaneedam P.O. Bengaluru 560091
E: ravi.joshi@cii.in | n.deep@cii.in | biju.raj@cii.in
W: www.tpmclubindia.org