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PQCDSM SYSTEM- A TOOL FOR IMPROVING THE ORGANIZATIONS PERFORMANCE AND THE EFFICIENCY WITH REFERENCE TO MAHINDRA CIE AUTOMOTIVE LTD, NASHIK

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Abstract: - Productivity, quality, cost, delivery, safety and morale (PQCDSM) are the parameters by which the performance of any industry can be measured in today's context. However, in an environment of stiff competition on price and quality, manufacturing goods with high level of productivity, quality (zero-defects), low manufacturing costs, on timed delivery to all customers all the time is not an easy task. Today, the main concerns in any manufacturing organization are mainly efficiency, effectiveness, performance, productivity, cost reduction etc. for facing the global Competition. To compete this global era, the performance of machinery is important. Productivity growth is important to a firm because more real income means the firm can meet its obligations to customers, suppliers, workers, shareholders, and governments and still remain competitive or even improve its competitiveness in the marketplace. Hence, effective management equipped with advanced technology is widely accepted to be a key factor in making organizations successful as well as improving performance and efficiency of organization. This study is carried out in Mahindra CIE Automotive Ltd, Nashik.

Keywords: Performance, Productivity, quality, cost, delivery, safety and morale



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INTRODUCTION

Productivity, quality, cost, delivery, safety and morale (PQCDSM) are the parameters by which the performance of any industry can be measured in today's context. However, in an environment of stiff competition on price and quality, manufacturing goods with high level of productivity, quality (zero-defects), low manufacturing costs, on timed delivery to all customers all the time is not an easy task. The other major factor in this challenging task is the 'people' dimension without whose collaborative working inside an organization (safety and morale); neither building nor maintaining PQCDSM becomes a reality.

The effectiveness of facilities has a direct bearing upon the competitiveness and profitability of a business and maximizing their effectiveness means that the best possible return is generated by each capita asset owned by the business.

The object of production improvement activities is to increase productivity by minimizing input and maximizing output. More than sheer quantity, "output" includes improving quality, reducing costs and meeting delivery dates while increasing morale and improving safety and health conditions and the working environment.

Total Productive Maintenance (TPM) strives to maximize output (PQCDSM) by maintaining ideal operating conditions and running equipment effectively. A piece of equipment that suffers a breakdown, experiences periodic speed losses and produces defects is not operating effectively. TPM strives to achieve overall equipment effectiveness by maximizing output while minimizing input.

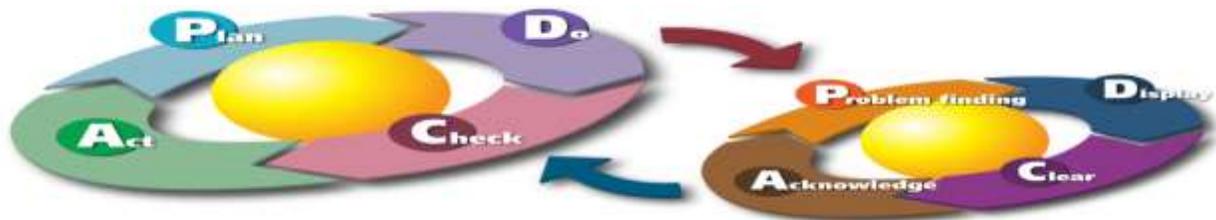


Figure- PDCA Cycle

PDCA (plan–do–check–act or plan–do–check–adjust) is an iterative four-step management method used in business for the control and continuous improvement of processes and products. It is also known as the Deming cycle, Shewhart cycle, control cycle, or plan–do–study–act (PDSA). Another version of this PDCA cycle is OPDCA. The added "O" stands for observation or as some versions say "Grasp the current condition." This emphasis on

observation and current condition has currency with Lean manufacturing/Toyota Production System literature.

Plan

Establish the objectives and processes necessary to deliver results in accordance with the expected output. By establishing output expectations, the completeness and accuracy of the spec is also a Part Of The Targeted Improvement.

Do

Implement the plan, execute the process, and make the product. Collect data for charting and analysis in the following "CHECK" and "ACT" steps.

Check

Study the actual results which is measured and collected in "DO" and compare against the expected results to ascertain any differences. Look for deviation in implementation from the plan and also look for the appropriateness and completeness of the plan to enable the execution, Charting data can make this much easier to see trends over several PDCA cycles and in order to convert the collected data into information. Information is what you need for the next step "ACT".

Act

If the CHECK shows that the PLAN that was implemented in DO is an improvement to the prior standard, then that becomes the new standard for how the organization should ACT going forward. If the CHECK shows that the PLAN that was implemented in DO is not an improvement, then the existing standard will remain in place. In either case, if the CHECK showed something different than expected, then there is some more learning to be done and that will suggest potential future PDCA cycles.

The PQCDSM system is one of modern system which acquired by many organizations .In this system whole departments of organizations are included. Due to that how it is helpful in improving the performance and efficiency of the company and its effectiveness to face globe issues, challenges in the business environment.

OBJECTIVES OF THE STUDY

1. To study the PQCDSM system of organization.

2. To observe the performance of organization under PQCDMS system.
3. To study how PQCDMS system is helpful in improving the efficiency of the organization.

RESEARCH METHODOLOGY

Data Analysis

The researcher has visited and collected the data of Mahindra CIE Automotive Ltd. The process used to collect information and data for the purpose of making business decisions. The parameters of the PQCDMS are calculated and observed as below.

Overall equipment effectiveness (OEE) is a hierarchy of metrics developed by Seiichi Nakajima in the 1960s to evaluate how effectively a manufacturing operation is utilized. OEE measurement is also commonly used as a key performance indicator (KPI) in conjunction with lean manufacturing efforts to provide an indicator of success.

The OEE calculation is based on the three OEE Factors: Availability, Performance, and Quality.

Availability = Operating Time / Planned Production Time

Performance = Ideal Cycle Time / (Operating Time / Total Pieces)

Quality = Good Pieces / Total Pieces

The system has got some regularity or control points applicable for each parameter of the PQCDMS. Which are Upper control limits (UCL), Lower control limit (LCL), Mean, Actual, and target. This data is entered in Excel sheet of it.

Upper control limits (UCL): Upper control limit is limit for highest level of work has to perform on particular day /within that period of time

Lower control limit (LCL): Lower control limit is limit for minimum level of work has to perform on particular day /within that period of time

Mean: Mean is the average amount of work done on that day. Mean = (UCL+LCL)/2

Actual: Actual limit is one that which is actual work is done on that particular day.

Target: Target is fixed by the company's management as per there rules and regulation. Management expects from their executive that they should reach to near to the target fixed by them.

This system includes the entire person in the organization from Top level management to the small employee of the organization which results in the performance of the organization.

Productivity

1	OEE	%	IF5	Not Applicable	UCL	80	83	81	83	80	81	83	83	83	83	83	83	83		
					Mean	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68
					LCL	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
					Target	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75
					Actual	52.33	51.52	55.17	47.32	56		60.4	63.7	66.9	68.8					68.4

Table 1- OEE



Graph 1- OEE

Interpretation: The above table and graph gives the information about Overall equipment effectiveness and it is calculated in percentage. At first few days the graph is below the LCL because of customer shut down.

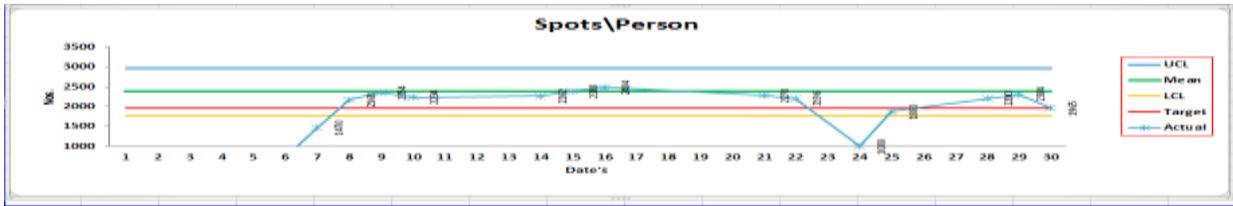
Spots and strokes

Spots are the point where Spot welding machine weld two parts .Each parts has specific numbers of spots. Spots are calculated by Digital counter which is fixed on the welding machine

Similarly the Strokes are counted on press machine. Strokes are used to convert the metal sheet into the particular shape of Die which is fixed into the press machine

3	Spots	Spots/Person	3000	Not Applicable	UCL	2968	2968	2968	2968	2968	2968	2968	2968	2968	2968	2968	2968		
					Mean	2386	2386	2386	2386	2386	2386	2386	2386	2386	2386	2386	2386	2386	2386
					LCL	1769	1769	1769	1769	1769	1769	1769	1769	1769	1769	1769	1769	1769	1769
					Target	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950	1950
					Actual	0	0	0	0	0		1470	2168	2354	2234				

Table 2- Spots/Person



Graph 2- Spots/Person

Interpretation: The above table and graph gives the information about spots .The spots are counted in spots/person .It has similar kind of electronic counter in build in it. At first few days the graph is below the LCL because of customer shut down. This work done at assembly area.

Quality

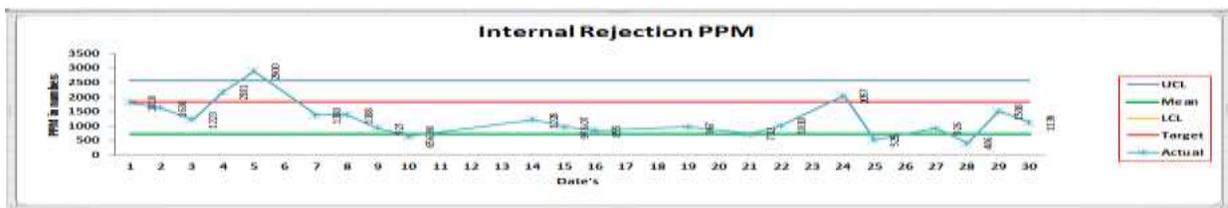
PPM (Parts per million) is a measurement used today by many customers to measure quality performance.

One PPM means one in a million or 1/1,000,000

Quality is the result of careful planning, design, and execution.

Internal Rejection PPM	PPM	500	Not Applicable	UCL	2570	2570	2570	2570	2570	2570	2570	2570	2570	2570	2570	2570	2570	2570			
				Mean	726	726	726	726	726	726	726	726	726	726	726	726	726	726	726	726	
				LCL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				Target	1831	1831	1831	1831	1831	1831	1831	1831	1831	1831	1831	1831	1831	1831	1831	1831	1831
				Actual	1818	1636	1223	2181	2500		1388	1388	927	656.88							1228

Table 3- PPM



Graph 3- PPM

Interpretation:The above table and graph gives the information about rejected or defective parts. This shows the how many part are defective in a batch of particular part. It is counted in parts.

Customer Complaint

A consumer complaint or customer complaint is “an expression of dissatisfaction on a consumer's behalf to a responsible party”.

Customer Complaint	Nos.	0	4Month	Target	0	0	0	0	0	0	0	0	0	0	0	0	0
				Actual	0	0	0	0	1	0	0	2	2	0	0	0	0
Warranty Claims	Nos.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 4- Customer complaints



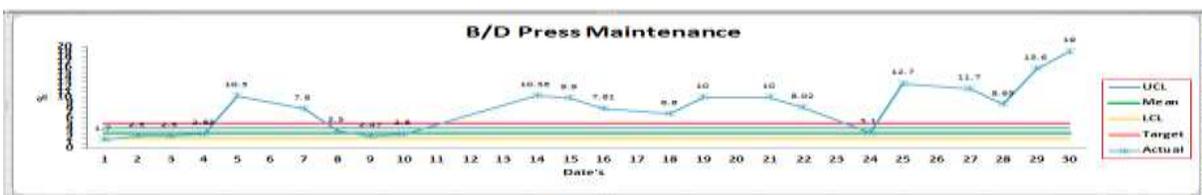
Graph 4- Customer complaints

Interpretation: The above table and graph gives the information about customer complaint. Ideally it must be zero. This is may be due to some technical problem during stamping or welding.

Cost

Machine B/D - Press Shop	%	2	Not Applicable	UCL	4	4	4	4	4	4	4	4	4	4	4	4	4			
				Mean	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
				LCL	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
				Target	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
				Actual	17	25	25	283	103	78	25	247	28	0	0	0	0	0	0	1036

Table 5- B/D Press machine



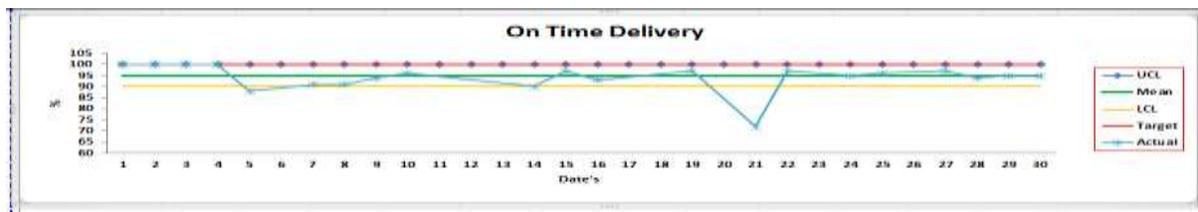
Graph 5- B/D Press machine

Interpretation: The above table and graph gives the information about machine B/D at press shop. Machine B/D should be as less as possible.

Delivery

On Time Delivery	%	100	100	UCL	100	100	100	100	100	100	100	100	100	100	100	100	100		
				Mean	95	95	95	95	95	95	95	95	95	95	95	95	95	95	95
				LCL	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
				Target	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
				Actual	100	100	100	100	98	95	95	94	96	95	95	95	95	95	95

Table 6- On time delivery



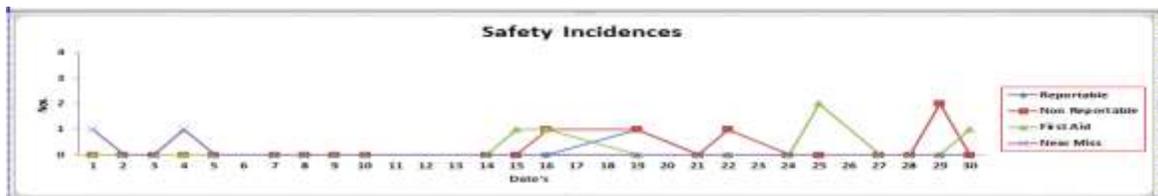
Graph 6- On time delivery

Interpretation: There must be on time delivery of product given to the customer. It helps in doing further work/used the product at right time.

Safety

13	Total Safety Incidents	Nos.	0	Not Applicable	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
13A	Reportable	Nos.	0	Not Applicable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13B	Non Reportable	Nos.	0	Not Applicable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13C	First Aid	Nos.	0	Not Applicable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13D	Near Miss	Nos.	0	Not Applicable	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0

Table 7- Safety



Graph 7- safety

Interpretation: Safety incident in the organization won't be happened this kind of care should take by the management.

Moral

Kaizen	Nos./Person/Day	5Person/Month	Not Applicable	UCL	4	4	4	4	4	4	4	4	4	4	4	4	
				Mean	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
				LCL	3	3	3	3	3	3	3	3	3	3	3	3	3
				Target	4	4	4	4	4	4	4	4	4	4	4	4	4
				Actual	0	0	0	0	6	0	0	0	0	0	0	0	0

Table 8- Kaizen



Graph 8- Kaizen

Interpretation: This graph and table gives the information about Kaizen. It gives knowledge about how many kaizen has been made in that particular period.

Absenteeism

'Absenteeism' The habitual non-presence of an employee at his or her job. Possible causes of absenteeism include job dissatisfaction, ongoing personal issues and chronic medical problems. Regardless of cause, a worker with a pattern of being absent may put his reputation and his employed status at risk.

Manpower Absenteeism	Nos.	27 (8%)	Not Applicable	UCL	50	50	50	50	50	50	50	50	50	50	50	
				Mean	40	40	40	40	40	40	40	40	40	40	40	40
				LCL	30	30	30	30	30	30	30	30	30	30	30	30
				Target	40	40	40	40	40	40	40	40	40	40	40	40
				Actual	75	70	52	53	0	0	72	50	49	36	0	0

Table 9- Absenteeism



Graph 9- Absenteeism

Interpretation: This graph and table gives the information about absenteeism of employee. Helps to identify what is reason behind the absenteeism

CONCLUSION

PQCDSM system helps to improve the organizations performance and the efficiency which will result in the improvement of profit. This system forces the employee to achieve the target in particular time limit in good faith. PQCDSM system helps to involvement of top level management to the employee which will increase moral of the employees. This system includes whole organization and each department of the organization which is beneficial to achieve organization's vision and mission.

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