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Cultural Change by Initiation of TPM in a Industry

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Abstract: *The purpose of this paper is to show the cultural benefits and change that occur by the initiation of implementing TPM in a industry. The main purpose during the implementation process is to change the mindset of the employees and adapt the new way according to TPM methodology which mainly focuses on the worker getting the feel of ownership of the machine. Which directly leads to the cultural change in the industry which brings many changes in the existing industry.*

Keywords: TPM, 5S, Kaizen, OEE, Fugai, OPL.

I. INTRODUCTION

Total Productive Maintenance was started as an approach to maintenance which aimed to integrate equipment maintenance into the manufacturing process. Total Productive Maintenance was started as an approach to maintenance which aimed to integrate equipment maintenance into the manufacturing process. A 12 step structured pyramid, guides the organization through the deployment of 8 Pillars combined with a number of more traditional improvement tools. The word 'total' in TPM explains about total organization or total participation. Everybody in the association at all dimensions and over all capacities assumes a functioning job in TPM including contract and low maintenance workers. OEE is a metric which is created to quantify the accomplishment of beginning period of TPM programs. TPM begins with 5S. 5S is known as the establishment stone for actualizing TPM. It is a Japanese procedure of housekeeping. Mainly the improvement and progress if implementation process of TPM depend upon the behaviour of the employees as they are ready to adapt the change than it will be very fast but if they resist than it becomes hard for the process. As for this research I had been working with the a Welded pipe manufacturing company in Gujarat over a period of nine months in the implementation process of TPM across the six different plants of that unit so had brief and practical view of the research topic.

II. OBJECTIVE

The main objective of this research is to list the benefits of Total Productive Maintenance in the cultural aspect of an industry. As implementing any of the tool in a industry is not important but there should be change in the mindset of the employees. So we will see what are output or benefits by the initiation taken by the industry in respect to the culture of the industry. The implementing process of TPM is a very long process as it can up to 3-4 years for complete implementation of 8 pillars across the industry. So changes are in different ways as the change in the production process and other is the cultural change so here we will focus on the benefits of cultural change in industry.

III. OUTCOME

During the initial period of implementation of Total Productive Maintenance at the welded pipe manufacturing industry there were some friction between the employees and the TPM mythology as the employees does not want to change their routine and go according to their traditional method and so there were some ups and down during the initial period of implementation.

But as the time goes and some benefits were showed up in relation to the machine or production process the employees start understanding more about the lean tool and then they tried to understand it . So then after probably around completion of six months the employees started to understand the benefits of TPM and how will be it benefits them in their day to work plan.

So the important things which are included in the cultural development or improvements are as the employees started feeling the ownership of the machine and they try to keep their machine in the best condition. So basically the maintenance practice which was done previously in the industry was done but was not properly managed or monitored but after the implementation o TPM started the maintenance practice was divided into different parts as TBM (Time Based Maintenance), CBM (Condition based Maintenance), Fugai identification, Kaizens were the initial steps which were taken in the industry. By this the maintenance work come under one screen and could be seen in a single glance. So there is a problem found than it could be identified easily as all could be seen on a single screen and it could be solved easily. By this all initial steps and work done the employees started to understand the benefits of TPM and its cultural as well as technical benefits in term of OEE. So they started to get the feel of ownership of their own machine.


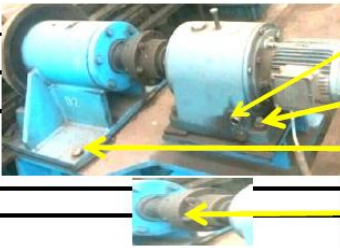
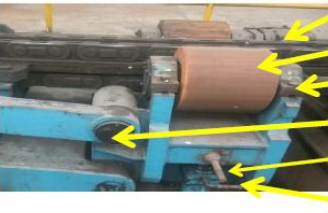
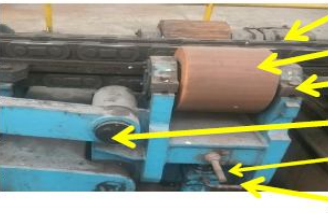
OPERATOR CLIT CHECK LIST - Reference Sheet for site activity											
LSAW/TW/04 & 05/001											
Assembly Covered		MHE (Chain Support Roller assembly 6, 7 and 8, Conveyor roller # 7, Rotator # 4)				Legend		Activity in stop condition		Min	
Station No.	4 & 5		CLIT Sheet No.		1	Revision no.		Activity in Run condition		Min	
Sr	Clit No.	Particulars	Photograph	What	Freq	Why		How	Time		
1	164, 166	Support toller unit no. 6		Support roller unit cleaning	W	To avoid the contamination of dirt and dust and To identify the abnormalities		Manual cleaning with cotton and diesel	10		
2	176, 178	Support toller unit no. 7			Housing unit mounting bolts	Y	To prevent looseness and subsequent misalignment/dislocation.		visual check of fastner match mark (OPL # 5)	2	
3		Support toller unit no. 8			Roller ass mounting	HY				2	
4		Support toller unit no. 6			Support roller surface its rotation	HY	To ensure smooth chain movement.		Visual (Inspection of roller surface and its rotation)	5	
5		Support toller unit no. 7				Complete Conveyor assembly	W	To avoid the contamination of dirt and dust		Manual cleaning with cotton and diesel	10
6		Support toller unit no. 8				Oil level of gear box	Q	To prevent lubrication failure		By visual inspection (OPL # 4)	2
7		Support toller unit no. 6				Gear box mounting fasteners	HY	To ensure fastener tightness and subsequent prevention of misalignment or dislocation.		visual check of fastner match mark (OPL # 5)	5
8		Support toller unit no. 7				Roller Unit mounting fasteners	Y				5
9		Support toller unit no. 8				Gear box coupling fasteners	HY	To avoid any abnormal condition in power transmission		visual check of fastner match mark (OPL # 5)	5
10		Support toller unit no. 6				Complete rotator assembly cleaning	W			Manual cleaning with cotton and diesel	10
11		Support toller unit no. 7				Rotator drive arrangement	M			visual check	5
12		Support toller unit no. 8				PU rotator lining condition	W			visual check	2
13	165	Conveyor no-7 (Zone # 4)		Rotator drive arrangement		M			visual check	5	
14	177	Conveyor no-7 (Zone # 5)		Roller bracket mounting fasteners		Q			visual check	2	
15	179	Conveyor no-7 (Drive Side -- Zone # 4)		PU rotator lining condition	W			visual check	2		
16	180	Conveyor no-7 (Drive Side -- Zone # 4)		Roller bracket mounting fasteners	Q			visual check	2		
17		Conveyor no-7 (Drive Side -- Zone # 4)		Hydraulic System leakage	Q			visual check	2		
18		Conveyor no-7 (Non Drive--Zone # 5)		Hydraulic hose condition	M			visual check (OPL # 6)	2		
19		Conveyor no-7 (Drive Side -- Zone # 4)		Hydraulic hose condition	M			visual check (OPL # 6)	2		
20	185	Rotator # 4 (Zone # 4 & # 5)		Hydraulic hose condition	M			visual check (OPL # 6)	2		
21		Rotator # 4 (Zone # 4 & # 5)									
22	183-184	Rotator # 4 (Zone # 4 & # 5)									
23	182	Rotator # 4 (Zone # 4 & # 5)									
24		Rotator # 4 (Zone # 4 & # 5)									
25	181	Rotator # 4 (Zone # 4 & # 5)									
26		Rotator # 4 (Zone # 4 & # 5)									
Prep. By:		Checked By:		Approved By		Date:					

Figure 1: CLIT Sheet

So this comes out as by a CLIT sheet which is known as Cleaning, Lubrication, Inspection and Tightening. This sheet includes all the machine parts and its important aspect in the single sheet which has its parts number mentioned in it, what type of maintenance work is to required, on what frequency, what would be its duration, it has to be done in running or stopped condition of machine etc all details are included with reference to CLIT which is Cleaning, Lubrication, Inspection and Tightening so this all aspects are to deal more frequently. Figure 1 shows an example of a CLIT sheet that a worker will have on its hand and work according to it which becomes very easy for them to work. Then comes the Fugai identification which is finding the abnormality in the machine. So if a worker finds any abnormality in the machine he has to put a Fugai tag at that place so everyone can notice it and the person responsible for solving that error could solve the abnormality. Kaizen also plays an important role in culture change as it is a path of connecting the lower and middle level to the higher level staff. Its generally the improvement done by the lower and middle level staff who are practically dealing with the machine and try to do some improvement work continuously. So there are many changes which I notice during the period of my role in industry as many creative ideas were brought by the lower and middle level staff to the TPM team. Also they were awarded with trophies for their good initiatives.

The main important need of cultural improvement was self discipline also as there are occurrence which i had seen in the industry as the required thing does not get at the time when its needed as whether it's a tool or an part of machine as no one bother and everything is mixed up and when needed could not found it. So by TPM 5S is the base step of TPM which includes Set, Sort, Set in order, Shine and sustain. So above problem of not getting tool or part will be solved and its practise could be seen in the figure 2 and 3. Cleaning and arranging the work place helps in recognize the issues. Distinguishing issues and obvious to individuals gives a chance of progress and getting fathomed. On the off chance that 5S isn't paid attention to, it can prompt 5D for example Deferrals, Defects, Dissatisfied clients, Declining benefits and Demoralized representatives. It should be sensibly natural how 5S makes an establishment for well-running gear. For instance, in a perfect and efficient workplace, instruments and parts are a lot simpler to discover, and it is a lot simpler to spot rising issues, for example, liquid releases, material spills, metal shavings from surprising wear, hairline breaks in systems, and so forth.



Figure 2 : Sort 5S

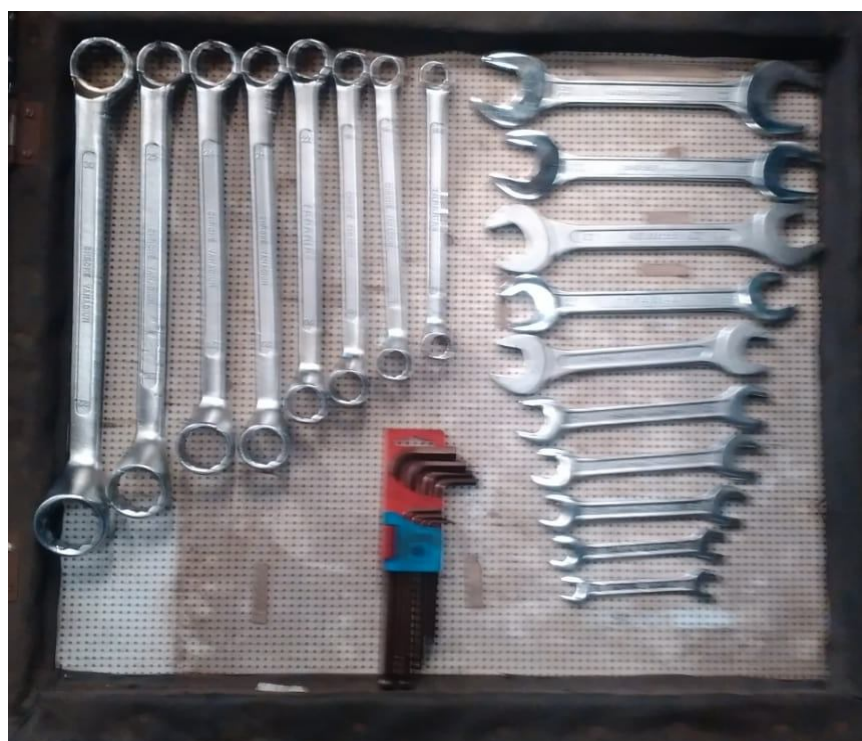


Figure 3 : Set in order 5S

Then after there are some things which are related to the topic is about one point lesson known as OPL which is been shown near the machine. So the main thing of this is to that a new person comes to work at that machine or station than he could easily learn about the machine and what things to keep in mind before starting the work on machine. This usually happens in the industry as due to break down or no work the workers are shifted to other plant of the industry to work. So the new person could make mistake if he has not done work on similar machine. So for that OPL photos are kept near machine so a new person could keep in mind the important aspects. Its example could be seen in the figure 4.



Figure 4 : OPL.1



Figure 5 : OPL.1

IV. CONCLUSION

In practice of the initial steps of Total Productive Maintenance there is a drastic change in the employee morale which directly lead to the cultural change in a industry. As now the employees feels the ownership of their machine which previously was a just work station to work for his shift which is now changed his priority for the machine. So in different parts of the cultural improvements could be easily spotted in the industry. And yes there is a lot of change as of changing the traditional mindset to the new mindset according to the TPM methodology. So its beneficial in many aspects in future to the industry.



V. ACKNOWLEDGMENT

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