

Career Episode 2

Introduction

CE 2.1 This career episode describes the details of my project “CHANGE OVER TIME REDUCTION OF OLMA MACHINE” submitted at ITM University, Gurgaon. I worked with the company, Whirlpool of India Limited. on this project from June 2012-JULY 2012 under the supervision of my supervisor, Mr. Pradeep Kumar Chaudhary. The main objective of this project was to reduce the change over time from 45 min to 15 mins

Background

CE 2.2 Whirlpool Corporation is the world’s leading manufacturer and marketer of major home appliances. There has been a rapid entry of global brands which has resulted in local infrastructure /industry waking up to opportunity and of course the threats. Whirlpool plans to launch products to suit Indian customers in various income groups. All high growth areas, which allow it to leverage WOIL’s existing strengths, the whirlpool products currently available in the market include Refrigerators, Air conditioners, microwaves, and washing machines. Whirlpool guarantees the performance, promise, and reliability of its products. All Whirlpool products are backed by suitable warranties and a wide network of service centers, Emphasis is placed on after-sales service and whirlpool strives to achieve those goals.

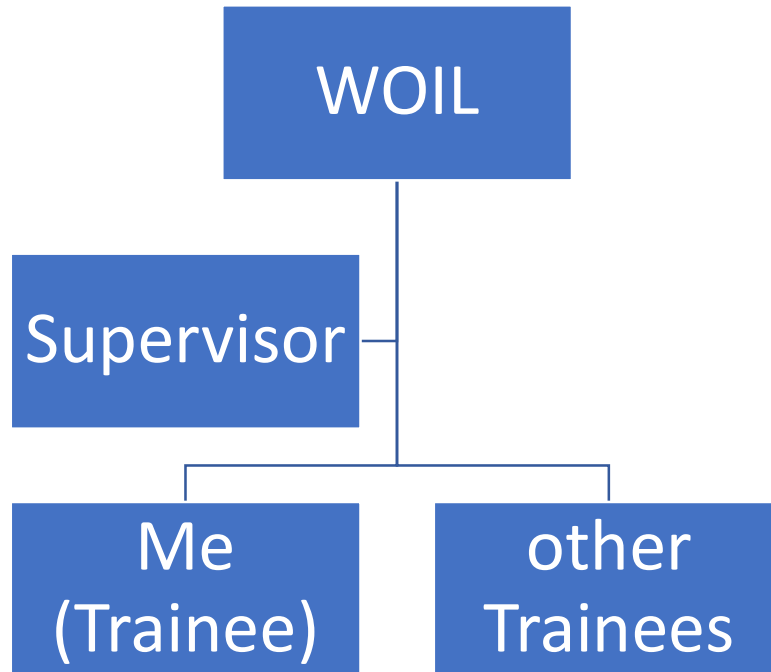
CE 2.3 There were some other machines where the change over time could be reduced, but I was assigned the task of reducing the change over time of OLMA only. This was the first thing I had to clarify. The intention behind this was for this machine to produce only two models 180L and 310L wrapper. The 180L is the highest-produced model in the company. To decrease the inventory holding of the painted shell, the two assembly lines of the plant run only for the 180L model. So the 180Ls production is continuous, so before the changeover they were required to store the stock of the product over the purpose for that much time. It increases the inventory and the risk of damage.

CE 2.4 The other model production was very low nearly 1000 in a month. So I preferred to produce all in once or in two times. This increases the inventory of the company and reduces the flexibility of production because it needs to plan and check the inventory of 180L before making the change over from 180L to 310L. So to increase the flexibility in production and to reduce the inventory cost of the company this project was important for the company. While the other machines were serving the purposes. By reducing the change over time, this time can be utilized to increase production.

CE 2.5 Following were my initial responsibilities in the project:

- Collecting the data of change over time (after improvements).
- Arranging the data.
- Analyzing the data.
- Make a possible and best (shortest time) flow process by considering two workers.
- Make a chart that shows the process of each worker and is displayed near the machine. So that the worker looks at that and understands the work they have to do. If any new worker came there he should also be able to make changes.

CE 2.6 Following hierarchy identifies my role in the project:

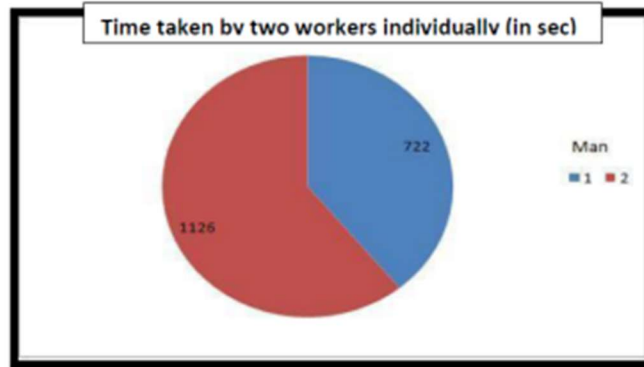


PERSONAL ENGINEERING ACTIVITY

CE 2.7 After understanding the meaning and needs of the project I started the study of the project. Understand the current situation by using the time study method, process flow, and SMED. After this, brainstorming was done with the seniors. Alternative solutions were found and checked their feasibility and practicality. After discussion with the guide feasible and best solutions were implemented.

CE 2.8 Observed and noted the timings of the workers and found that one worker – 76 min, Two workers – 42 & 45 min, Three workers – 39 & 25 min. This whole setup was done by a single man except for the sheet bundle replacement that was done by another worker. But during this, the 1st man was idle and looking at the others. The total time taken in changeover was 76 min. But the setup time was 39 minutes and the 1st piece came out after 50 minutes and the other 26 minutes was taken for inspection and correction. Some processes were done always after the inspection e.g. adjust the dies at punching and notching section for the adjustment of hinge hole at the top side of cabinet etc.

CE 2.9 Following Pie chart shows that there was no time distribution between workers. There was no standardization of the procedure of changeover. Operations were not divided into workers. They start to change over according to them and sometimes they commit mistakes and this leads to an increase in change over time and this also generates the scrap of one or two pieces. They took 20-30 min to correct and inspect.



CE 2.10 Now I have finished with the observation part. Now the analysis starts that how things were happening and what changes can be done. Problems were in front of me as mentioned above. So first of all, the thing comes how can I reduce the setup time and finally change over time? For the above problems I have made a description chart of activity as shown below: the chart shows the activities that were done during the changeover, their time, the activity is internal or external, why the activity is done and what else can be done.



Activity no.	Activity Description	Time (sec)	Internal/External	Why this activity	What else can be done
1	Sheet replacement	480	Internal	Difference in Length & width of sheets	It can be made external
2	Punching & notching die adjustment				This can be done as the last piece is in process.
	Adjusting three dies on one side by removing & inserting pin one on each	90	Internal		it can be done as the last sheet is in process
	replace two packings	30	Internal	To Adjust width	
	Adjusting three dies of other side	120	Internal		Parallel to the other side dies so can be done as last piece is in process.
3	Width adjustment				
	Go to take the spanner from almurah	28.95	External	Because the width of sheet is different for diff size	Spanner should be with the worker(in pocket etc.)
	Loosening & tightening of two nuts with the spanner & replace packings	210	Internal		A T-shaped opener can be used instead of simple spanner or a system can be fixed that make it easy and fast
4	Width adjustment at roller operation m/c				
	Replace two packing's	90	Internal	to adjust the width	
5	Adjustment of dies at Z-bending operation				
	Just remove the pins and slides the dies and insert the pins again	40	Internal		
6	Adjustment of width of conveyor				
	Loose the screws and slide the railing & fasten the screws again	120	Internal	To adjust the width	
7	AT edge bending section				
	By removing or inserting	210	Internal	Adjust the width of	The no. of screws can be

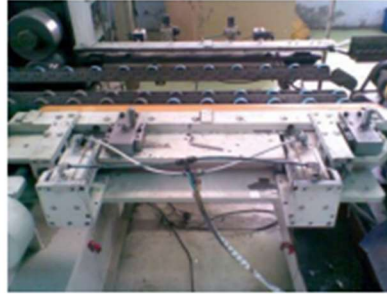
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	two pads with the help of 9 nuts on each by using <i>Allen key of 6 number</i>			two bending pads	decreased.
	open up 4 bolts using <i>Allen key</i>	57.86	Internal	Remove the guides for increasing width	Pins can be used instead of bolts or A single screw can be used
S	AT folding section				
	move two guide pushers forward by Loosing & tightening two nuts on each by using <i>Allen key of 6 number</i>	142.2	Internal	Adjust the width	Pins can be used instead of bolts
	Remove two pressing pads by opening 6 screws using <i>Allen key</i>	190.8	Internal		
	Adjust the position of stopper by removing a pin & sliding & then insert it	52	Internal		Nut can be replace with a small pin by making a hole at end of bolt or can b avoided
	Adjustment of length of bed by loosening a nut using adjustable spanner	40	Internal		

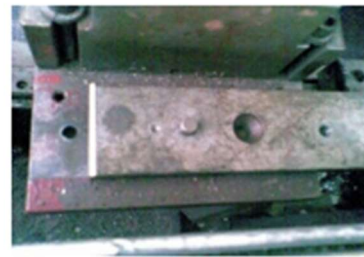
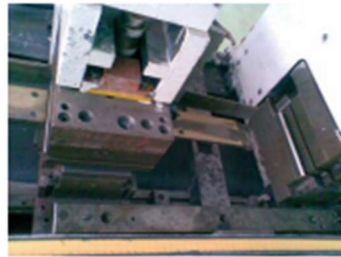
CE 2.11 Many solutions/suggestions were written on this. Many of these were applied and some were rejected after discussion with a guide. The second thing was what should I do or what changes I can make in the procedure of change over so that the first piece came ok. As mentioned shown that normally 20 -30 minutes were consumed in corrections. There were two problems that I faced during the project, there was no standard procedure of change over Solution and I solved this problem by balancing the activities of workers and making a chart that describes the activities of each work that he has to do during the changeover. I also displayed the chart near the machine so that the worker got to know what he has to do and in what sequence.

CE 2.12 I also noted that due to some operations that were done only after inspection Solution and I resolve this matter by eliminating those processes in process line or changing those processes so that those can be done earlier means before the checking. Till now I understood the problems and have some idea what else can be done. But I did not know how much these ideas were feasible and reliable. After getting these ideas discussion with a guide and other seniors in the company mainly in the process department and production department started.

CE 2.13 As other seniors were also working on the same project I discussed with them and some ideas were rejected and some were implemented with their help. I dealt with some situations and handled them carefully. I did the width adjustments by opening a screw using a simple spanner and replacing the C-type thin pad and three strips were inserted (during the change over from 180L to 310L). I discussed with my team and some suggestions were made and I came up with a solution that was to install a pneumatic system there. Changes will be done by using dowel pins. This reduced the time as required. This problem was increasing both the setup time & correction time. After implementing the solution, the setup time was reduced from 230 sec to 30 sec and the correction time was also reduced by 30% approximately.



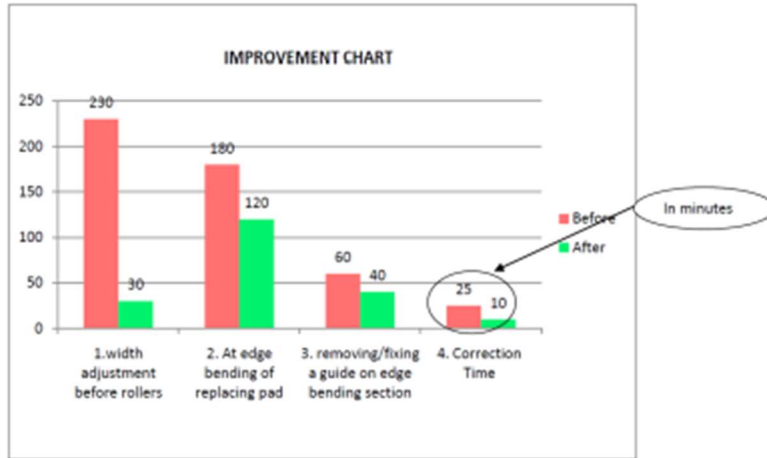
CE 2.14 Another most time consumable process or situation was an adjustment of dies that makes a hole for the hinge in direction of the flow of the process. This activity was consuming a major part of correction time(about 50%). So this was the most critical activity for study. By implementing a reduction in change over time is very less but by doing this the correction time is reduced by 50%. This activity was the most time-consuming during the correction. After all implementation as above shown, the current change over time is 25-35 minutes.



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CE 2.15 Above problem was high time consumable after that there were some other small-small changes were done. I decreased the no. of screws of the edge bending die from 12 to 9. Earlier 12 screws were used on each side but there was no use of them. Those were just for tightening the pad. So I tried it at 9 screws after a discussion with Mr. Pradeep Chaudhary and it was successful and hence implemented. I Decreased the no. of screws of the guide from 2 to 1 at each edge bending guides were just to reduce the width and to provide support to the sheet. There was no high pressure on the guide so I reduced the no. of screws from 2 to 1 and also the no. of threads on the screw so that it opens in one turn and time can be saved. The result was implemented and it reduces the setup time from 267sec to 160 sec.

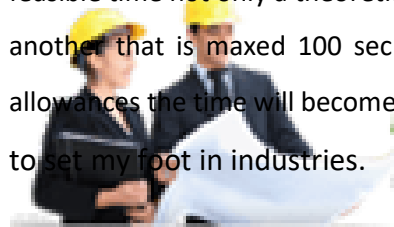




According to the above chart the change over time will be 500 sec.

SUMMARY

CE 2.16 In this project I played the role of an engineer and engineering in the industry. I developed good communication and interpersonal skills. After all, improvements were implemented. It is a feasible time not only a theoretical time. Allowances can be added as the movement from one section to another that is maxed 100 sec for all operations and to come back to the start point. After adding allowances the time will become 600 sec or 10min. My managing skills improved a lot and I am ready to set my foot in industries.



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