

Production Study in Steel Industry: A Case Study

About the Client

- Client is a steel manufacturing company based out in India.
- Client makes variety of steel components and having multiple plants in multiple location of India.

Aims/Objectives

- Setup activity work measurement using PMTS technique
- Capturing losses
- Ideal Vs actual setup time
- Suggestion for Improvements

Client's Challenge

- Measurement of actual setup time
- Activities / Losses identification

PMI's Approach

The study was organized in a 3-stage process:

1. Data Collection – Video shooting of all activities under scope for 6 days.
2. Estimation & Data Analysis – Estimation using PMTS Technique ,Validation by client and data analysis .
3. Results and Conclusion - Improved productivity, Improved manpower utilization, identification of NVA work content.

Involvement of Associates –

- PMI – 1 Project Manager, 3 Engineers.
- Client – 2 Project Co-ordinators.

Data Collection-

- Visiting client site and performing CFT formation and site round.
- Data collection in person observations of all activities under scope with more than **70 observations** per day considering peak and off peak timings.
- Interaction with client to understand process and timely observations.

Data Analysis -

- Preparation of excel sheet using work sampling & validation by client.
- Analysis (Work distribution/VA-NVA identification) for manpower calculation, optimum manpower utilization & identifying capacity.
- Dashboard preparation.
- Improvement & suggestions for fatigue reduction & making existing system better.

Working STATION : END BRICK JAM REMOVAL															
SUBOPERATION : LIFT MOVEMENT BY OPERATOR															
Sr. No.	Element Description	Code						Freq	Man	On/Off	MOD	WCT (Sec)	CT (Sec)		
1	Walk 5 step(s) TOWARDS LIFT CONTROLLER	S	W	M	G	W	M	P	NA	1	1	1	25.00	3.23	
		Idx	5	0	0	0	0	0	0						
		Freq	5	1	1	1	1	1	1						
2	Full Arm Move Grasp without feedback CONTROLLER KNOB Hand Move FOR TURN KNOB TOWARDS FRONT SIDE	S	W	M	G	W	M	P	NA	1	1	1	7.00	0.90	
		Idx	0	4	1	0	2	0	0						
		Freq	1	1	1	1	1	1	1						
3	Forearm Move Grasp without feedback LIFT BUTTON Hand Move TO START LIFT MOVEMENT TOWARDS LADDER	S	W	M	G	W	M	P	NA	1	1	1	6.00	0.77	
		Idx	0	3	1	0	2	0	0						
		Freq	1	1	1	1	1	1	1						
4	LIFT MOVEMENT TOWARDS LADDER - 10 SEC..									1	1	1	77.52	10.00	10.00
SUMMARY SUBOPERATION: LIFT MOVEMENT BY OPERATOR											115.519	14.902	14.902		

Date	Shell - Life (Heats)	Shift	Shell no	Observed Set up time (mins)
5-Jul	1-240 2-285	1	2	26
		1	1	35
		1	2	29
		1	2	35
		1	1	28
		2	2	30
6-Jul	1 - 254 2 - 03	1	2	22
		1	1	15
		1	1	61
		1	2	51
		1	1	29
		2	1	20
7-Jul	3 - 67 4 - 25	2	2	27
		1	4	25
		1	3	31
		1	4	24
		1	3	20
		2	4	30
		2	3	28
		2	4	23
		2	3	25

Cyclic Activities					
Crown Formation Removal	Ebt Mass Filling & Furnace Levelling	Hot Metal Lifting & Positioning	Hot Metal Top Pouring	Hot Metal Launder Car Pouring	Top Lance Positioning

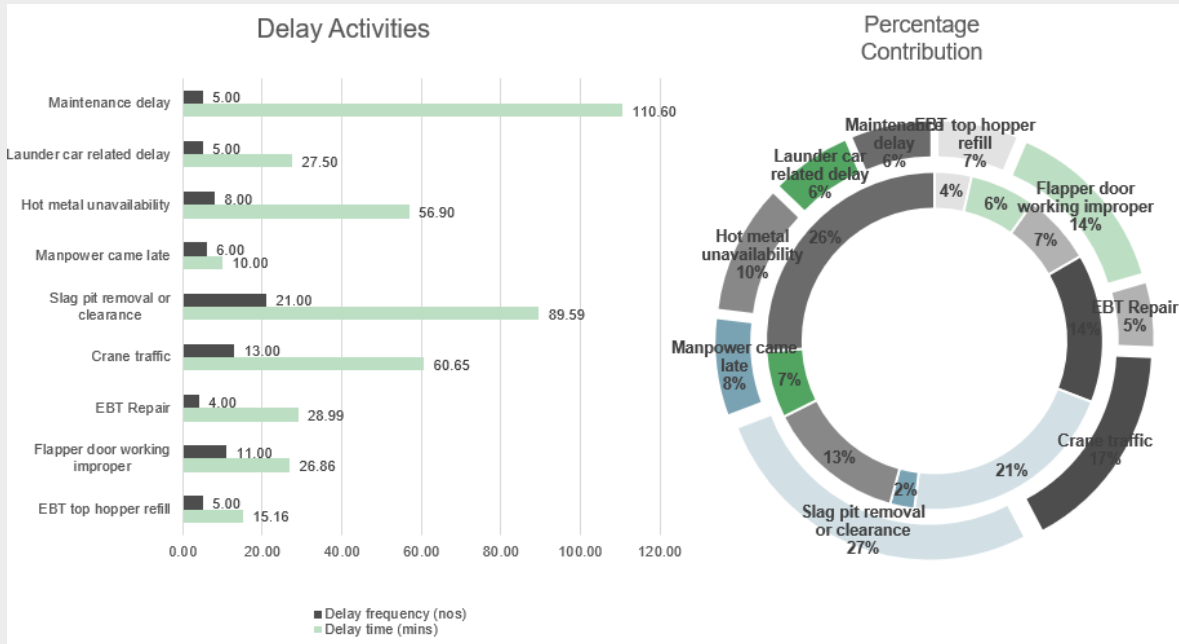
Non cyclic Activities					
Gunning	Fettling	Scrap charging	Central electrode change	Slag Door Cleaning	Top shell removal and Inspection

Delay Activities								
EBT top hopper refill	Flapper door working improper	EBT Repair	Crane traffic	Slag pit removal or clearance	Manpower came late	Hot metal unavailability	Launder car related delay	Random delay

Results & Conclusion

After doing analysis and evaluation following results were obtained –

1. Losses contribution of activities
2. Improvement and recommendations for making existing system better.



Sr. No.	Operation	Delaying Activities	Suggestions
1	EBT filling	<p>Top Hopper Refill</p> <p>A. Material availability in Top hopper is uncertain. If occurs unplanned, then activity takes additional time for crane movement and manpower allocation to tear packet.</p> <p>B. Crane is ready with material, manpower came late.</p>	<p>A) Provision for knowing present material status</p> <ol style="list-style-type: none"> 1. Camera positioned near roof or crane and live footage in the controller room 2. Sensors (if they can sustain extreme temperature) <p>B) To avoid manpower delay</p> <ol style="list-style-type: none"> 1. Blade like provision on hopper to tear the packet (similar to one on the gunning hopper)
2	Slag door cleaning Slag pit clearance	<p>A. If these activities delayed will cause obstruction to start Pouring or will hold on-going Hot metal Pouring</p> <p>B. Vehicle unavailability (1 forklift & 3 Caterpillar shared between two shells) in case breakdown or chain repair.</p>	<ol style="list-style-type: none"> 1. Both activities should be completed in parallel to Hot metal Lifting & Positioning. 2. Use material handling vehicle with Higher Capacity 3. Slag could be allowed to fall on the refractory lined, water impounded, steel fabricated Hopper having sufficient capacity and Converised material handling system for slag disposal or stacking.

Contact Details

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