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A Case Study on Productive and Non Productive Time

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Abstract

In an organization the prime importance is given to the quality and productivity, which is solely, depends upon the on defects in the product, accidents, down time in the production, working conditions, housekeeping etc. Too often the best drilling practices used to address trouble zones are limited to a few conventional methods with a narrow range of effectiveness. Also, a lack of rock mechanics knowledge can prevent the most efficient solution being applied. Some operators are implementing planning programs that assess and integrate the latest processes and technologies to address drilling risks up-front. Cutting-edge technologies such as managed pressure drilling methods, drilling with casing drilling with liners, and solid expandable casing have been highly effective. Implementing proactive evaluation processes and applying the latest tools and techniques can efficiently address operational risks and trouble zones to ultimately reduce NPT and associated costs.

Keywords: Npt1, Productive time(PT)2, Theoretical Time3, Non Machining Time4, Machining Time5 etc..

Introduction

AREA OF CASE STUDY :- PRODUCTIVE AND NON PRODUCTIVE TIME OF MACHINING.

Our area of case study is sequence of operations performed on job. Productive time required for each operation and also finding nonproductive time(NPT)

Objective Of Case Study 1

The objective of case study is to **study the actual machining time and to compare it with theoretical time** .To study the actual time required for operations performed and also productive and nonproductive time. And to determine scope for reduction of non productive time to increase productivity and to compare the actual machining procedures with theoretical concept.

Problem Identification2

1) Time difference between theoretical time required for the completion of job and actual time required .
2) Non productive.

We study the theoretical time required for each operation performed on job and actual time required. The time loss in handling material, waiting situations due to previous operation . time taken by workers. Loading of job on lathe or any other machines etc.

Elaboration Of Problebs2

EN-8 round bar records its machining time required in actual process and theoretical time required ,to find time losses in nonproductive time & productive time.

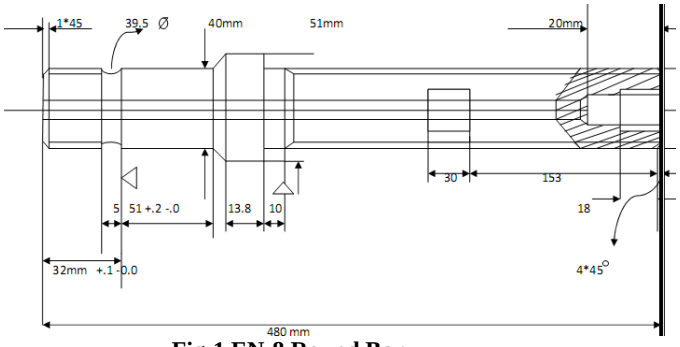

Fig-1 EN-8 Round Bar

All the activities were then recorded on a flow process sheet and have been summarized by the team. The non-productive time for each of the above work centers was calculated.

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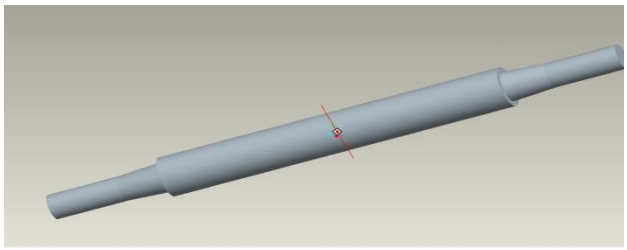

Fig-2 PRO-E Model of EN-8 Round Bar

Table-1 PROCESS SHEET

OPERATION NO.	MACHINE	OPERATION	TOOL/GAUGE
1	LATHE	FACING	SPCT
2	LATHE	TURNING	SPCT
3	LATHE	THREARING	SPCT
4	LATHE	BOARING	BOARING TOOL
5	LATHE	THREADING	SPCT
6	LATHE	FACING	SPCT
7	LATHE	TURNING	SPCT
8	LATHE	CHAMFERING	SPCT
9	LATHE	GROOVING	SPCT
10	LATHE	THREADING	SPCT
11	-	-	-
12	-	TAP	MG TAP
13	-	INSPECTION	VERNIER CALLIPER

Theoretical Time Estimation1

Motor speed = 1440 rpm
Diameter of motor pulley = 3 inch
Diameter of big pulley= 2.1 inch
Diameter of pulley 1 =D1 = 10 inch
Diameter of pulley 2 =D2 = 8.5 inch
Diameter of pulley 3 = D3 = 7 inch
N1* D1 = N2* D2
1440/ N2 = 21/3
N2=205.7 rpm
N1 * D1 = N3 * D3
1440 * 3 = N3 * 7
N3 = 617
Similarly ,
N4 = 508.2 & N5 = 432 rpm
N3 * D3 = T1 * N6
N6= 617 * 7 / 46 = 93.89 rpm
T1 * N6= T2 * N7
46 * 93.89 = 52 * N7
N7 = 83 rpm
N8 = 52 * 83 / 28 = 154
N9 = 28 * 154 / 70 = 61.6 rpm=N

1> Turninig

a> 280*0.001/0.001*62
=4.5 min
b> 280*0.001/0.001*62
=4.5 min
12
c> 280*0.001/0.001*62
=4.5 min

Similarly d=e=f=4.5 min

i> T=200*0.001/0.001*62
=3.2 min
ii> P=200*0.001/0.001*62
=3.2 min

Similarly iii=iv=v=vi=3.2 min
Total time=(6*4.5)+(6*3.2)=46.2 min

2> Facing

T=L/Fn
=25.5*0.001/0.001*62
=0.41
Total time =2*0.41=0.82 min

3> Drilling

T1=L/fn
=480*0.001/0.001*62
=7.75 min
T2=480/62=7.75 min
Total time=(2*7.75)+(2*7.75) =31 min

4> Tapping

TP=(L+D)/2*(P*N)

=(344.2+39)*0.001/2*(0.5*0.001)62
=6.18 min

5> Threading

T=L*D*d/P*V*T
=344.2*51*39/(0.5*9.8*2)
=1 hr 10 min

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Comparisons between Practical Time & TheoreticalTime1

Table-2 Comparison Between Practical Time & Theoretical Time

Sr. No.	Operation	Practical timing (min)	Theoretical Timing (min)	Difference Tht – Prac t (min)	Time Save (min)
1	Cutting				
2	Facing	90	50	40	40
3	Turning & Taper Turning	120	90	30	30
4	Drilling	60	32	28	28
5	Tapping	15	7	8	8
6	Threading	75	70	5	5

Conclusion

The team took up the task of reducing the non-productive time in the various work centers of the plant, so as to improve the cycle time of the job. The task of reducing the nonproductive time was more economical At each work center, the process should be elementised into smaller activities and the time for following elements, i.e., operation time, waiting time for helper, waiting time for handling equipment, loading and unloading time and transportation time should be reduced for increase in productivity.

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