

OVERALL EQUIPMENT EFFECTIVENESS EVALUATION

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ABSTRACT

At present it is very important for a firm to be able to compete with others by lowering expenses and using available devices and machines in the most effective way. For this purpose, an OEE factor and its monitoring can be used. The OEE allows us to find the most frequent causes of wastes in manufacture with respect to three rates: availability, a performance rate and a quality rate.

1 INTRODUCTION

The article deals with practical evaluation of real data from manufactory and finding the most frequent causes lowering overall effectiveness of an assembly line. Used data were obtained from the firm CzeEika s.r.o. from Prostějov. The firm produces heating devices for electrical appliances.

Data were evaluated for one assembly line in the period of 4 working weeks. The software procedure in Excel, which draws daily and weekly charts of OEE and its rates, was created for the evaluation.

2 DATA ANALYSIS

Week		First				
Day		Mon	Tue	Wed	Thu	Frid
Availability	[%]	74,2	88	91,7	84,4	90,9
Performance rate	[%]	97,1	99,2	98,9	96,2	96,8
Quality rate	[%]	86,4	97	99,3	91,5	94,9
OEE	[%]	62,2	84,7	90,1	74,3	83,5

Tab. 1: OEE and its rates in the first week period

Table 1 shows measured data in the first week period. Each rate is expressed in percent and OEE is a product of availability performance rate and quality rate. For example monday availability was 74,2 %, performance rate 97,1 % and quality rate 86,4 % then the OEE is 62,2 %.

3 MONTHLY SUMMARIZATION

The course of OEE and its rates in the whole time period can be seen in the figure 1.

As it can be seen in the picture, OEE ranged between 60 and 90 %. The performance rate stagnated near 100 %. The most problematic rate was availability which ranged between 60 and 90 %. The quality rate ranged between 70 and 100 %.

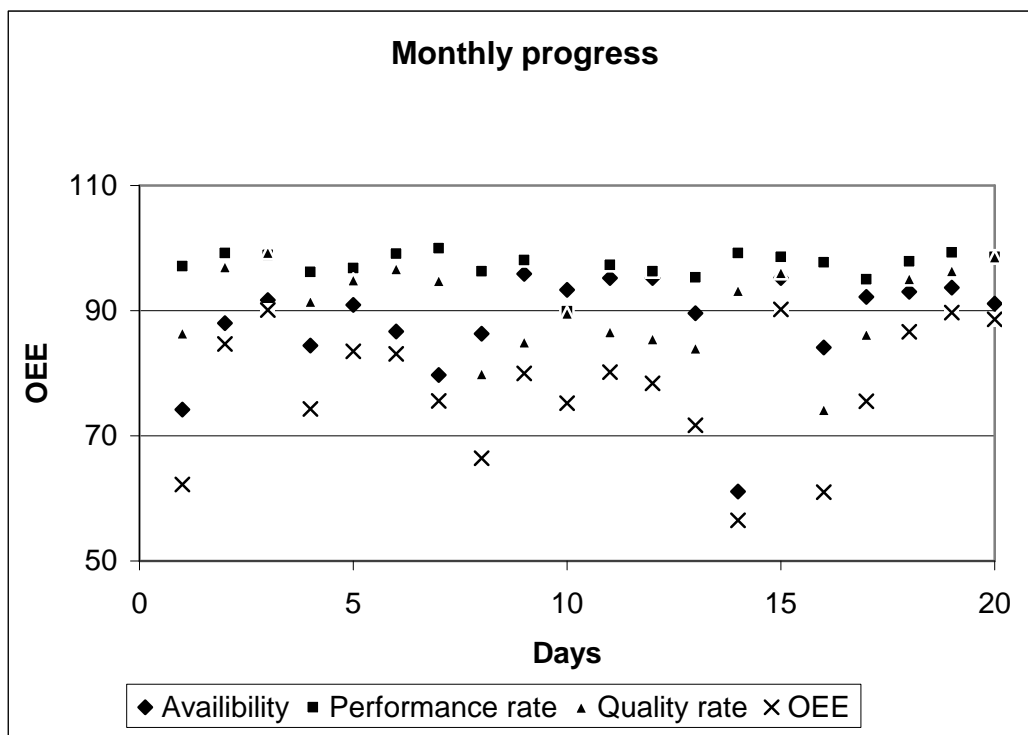


Fig. 1: Monthly progress of OEE and its rates

4 PRACTICAL IMPACT

In the table 2 calculated average rates in the whole time period can be seen.

Availability	88,50 %
Performance rate	97,30 %
Quality rate	90,50 %
OEE	77,90 %

Tab. 2: Average rates in the whole time period

In the figure 2 participation of individual losses in overall losses can be seen.

It can be seen in the figure 3, how much time of planned production was lowered by the individual rates and how much of fully productive time was left. A spotted area illustrates the availability loss, a blank area illustrates the loss caused by performance rate, a squared area illustrates the quality loss. A horizontal hatched area illustrates fully productive time.

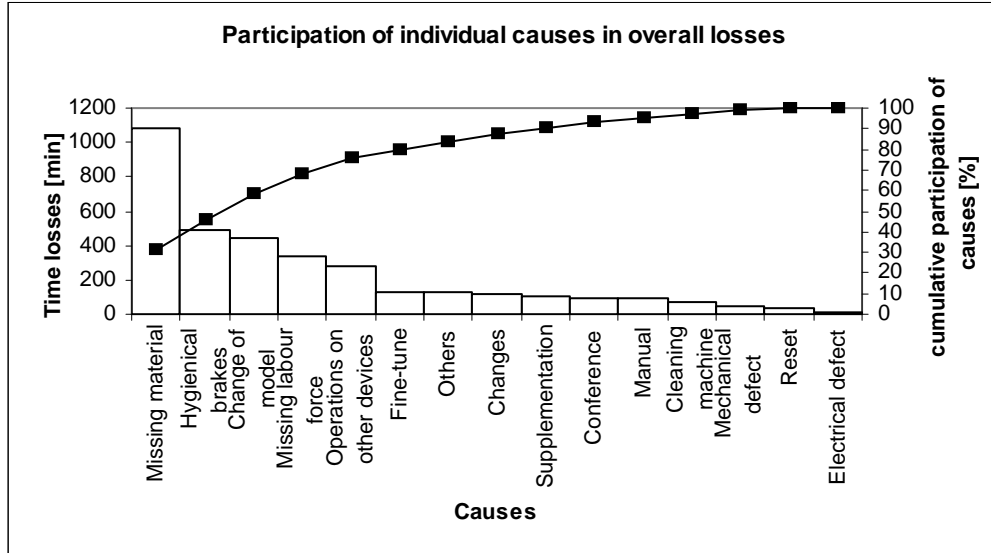


Fig. 2: Overall losses

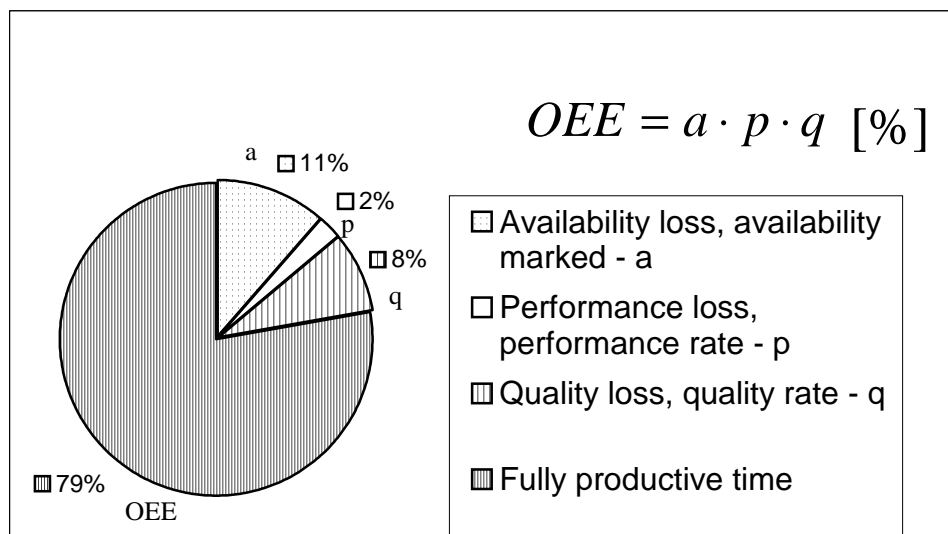


Fig. 3: Effectively used time and losses in the whole period

5 CONCLUSION

The article presents detected facts concerning time losses in manufacture of the firm CzEika s.r.o. from Prostějov. The most common causes are evaluated in the final time chart depicting losses and fully productive time. The average rate in the monitored time period was 77.9 %. Possibilities for improving OEE are wide.