

STATISTICAL METHODS IMPLEMENTED IN SAVING FUEL

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Maintaining competitiveness requires that companies were forward in sphere of quality or price, which is mainly determined by the level of costs. It is not possible without analysis of individual costs factors, which they influence the price of transport markedly. Task of each transport company is to ensure its effective functioning and make a reasonable profit, which is decisive a key economic indicator.

The aim of this work is to description, but mainly analysis an factors affecting the cost of fuel consumption as a crucial component of costs the company. Ultimately, overall efficiency of transport process.

K e y w o r d s: Transport, statistical methods, correlation analysis, costs

1 INTRODUCTION

Nowadays, companies are under increasing pressure of reducing costs. They are forced to economize on their resources, monitor and reduce their costs, because more costs mean the less profit.

However, cost reduction should not be pursued at the expense of other costs or risk the quality of corporate performance or safety. Optimizing the operation costs is process, which ensures optimal cost. With an emphasis on the reduction of a expedient measure and we notice the influence of various factors on the level of costs, the negative effects we are try to reduce, or eliminate.

Fuel costs are one of the highest cost items companies which have large car park. This mean that cost is variable, the amount is directly proportional to operation and increasing the operation lead to increase cost of fuel. The amount of these costs influence several factors. One of them is fuel prices which showing significant variations that we can hardly control. Companies and individuals receive negative although it is a change of several tens of euro. The reductions in consumption of a liter per hour is often more saving [1].

The aim of this analysis is to show on possibilities of optimizing the cost of fuel used in the operation of motor vehicles in the company and also suggest the possibility of this analysis, which could mean a real reduction of costs [2].

2 TRANSPORT COMPANY

The transport company is located in Kosice entry area U.S. Steel where it provides services. It was established in 1993 and have worked there 195 employees. This company is one of five divisions of corporation, providing a wide range of outsourcing services in 160 metallurgical leading steel mills in 30 countries. In particular, the objects of its activities in are processing and recycling of steel slag, sludge and dust, and the pellet agglomeration of steel dust. The capital is 82 985 EUR, of which the extent of repayment is 82 985 EUR. The company has received from U.S. Steel Kosice new contract for the next 10 years. It operates 68 industrial machines brands CAT Kamag, Liebherr and Manitowoc, which they are working daily in continuous operation, usually in a dusty environment. These machines are used for the five centers in the area of U.S. Steel [3].

Mainly. We rely on internal data on fuel consumption, operation data on vehicles from manufacturers and economists provided partial data from the income statement and balance sheet. In developing the work we used the following methods: statistical methods, in particular the correlation method of analysis, methods of evaluation of investments and the average cost method [4].

3 MODEL APPLICATION

In operation of company is 68 working machines particular brand CAT Kamag, Liebherr and Manitowoc. Of these, not all vehicles were

used. Therefore we only evaluate the condition of specified vehicles with non-zero consumption. These machines are located at five separate sites in the area of U.S. Steel. The situation on individual workplaces created images clearly in terms of demands for fuel consumption as a percentage of consumption of individual centers to the total amount of fuel consumed in 2009.

We can see that the largest share of consumption has a center ZST. The ratio is influenced both by the number and type of vehicles used and the time of service. For the year 2009 the company consumed with 2310 287.89 liters of diesel, the average price of diesel was 1.088 euros per liter for 2009 it was 2,513,593, 22 euros.

According to information obtained from interviews with the economist, the orientation state these costs constitute 58% of the total cost for this year. The total cost of 4334 amount to 402.10 euros and total benefits 6 587 554.40€

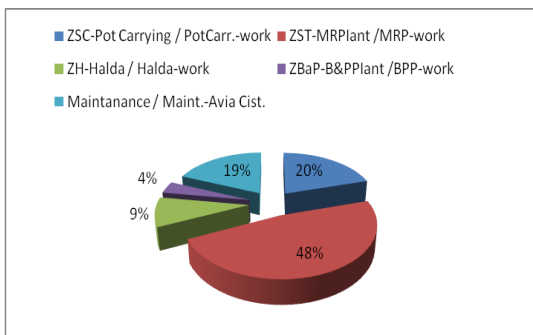


Figure 1 The proportion of individual work centers on the overall fuel consumption

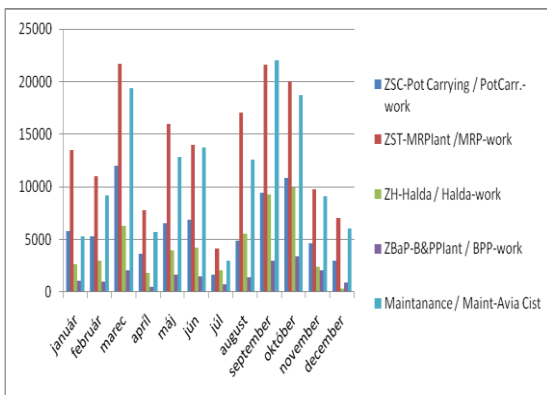


Figure 2 Development of fuel consumption for each month of work

We can not say that the cost of fuel consumed show signs of uniformity. On the contrary, we see overall trend in increased consumption, particularly in March and September, common to all centers, which refers to the overall growth powers in this period.

Changes in fuel consumption for each center to be seen with the number of vehicles in operation. Not all of the 68 vehicles are consistently used each month. On average per month was in operation 46 of them. Figure. 3 shows us how the change of number of vehicles used in the division for individual work centers.

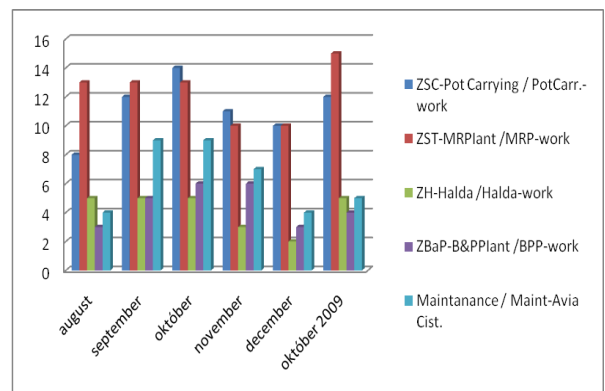


Figure 3 Changes in the number of vehicles used in the workplace

This is particularly theft of oil, driving technology, compliance with optimum speed, season, weather, type of oil transported material.

4 DISCUSSION

Cost of fuel is not enough just to analyze the business corporation or just for his work centers. In order to achieve the most accurate calculations of the required analysis for each of the 68 vehicles, resulting in a large number of graphs and tables. While respecting the scale and scope of work, to put them all, is not practical or possible. For our target vehicles of interest, which is over-reported consumption deviates from the power claimed by the manufacturer. The method of correlation analysis, we recognized consumption compared to the consumption stated by the manufacturer. The 64 vehicles were the result of a strong, direct relationship between the variables.

Correlation coefficients were positive, the values of 0.714 to 0.801. These values tolerated.

It concludes that the real consumption of vehicles is governed by the consumption of some indication by the vehicle manufacturer. The consumption of these vehicles does not exceed the maximum limits indicated by the manufacturer, so these vehicles do not show over-compensation and therefore do not need to be further explored. Another situation for the remaining four vehicles. In these variables were directly, but weakly correlated. The correlation coefficient was in the range from 0.318 to 0.4. It considered that the consumption of these vehicles in this case rarely manages the values given by the manufacturer. The data on real consumption of each vehicle, we found that it consumed more fuel than could be consumed in the number of hour meter. Fuel is not taken to a warehouse, but directly to individual vehicles and works vehicles. Since the difference was about 16,456 liters per vehicle for one year, there is a suspicion of theft of fuel by staff or it can be assumed that the vehicles are of a technical defect that causes their over-consumption.

To ensure the economical use of vehicles is important

- to detect vehicles with economical operation and high operational fuel consumption
- precisely identify the causes of increased operating fuel consumption
- the cause of increased operating fuel removed immediately and ensure cost-effective mode of operation of the vehicle.

To determine the reasons for high fuel economy suggest the following procedure:

- vehicle selection,
- check the accuracy of the records of actual fuel consumption
- the measurement of fuel consumption during operation,
- roadworthiness,
- measurement of fuel consumption during operation,
- control driving techniques driver or drivers replace,
- the average cost method of evaluation.

We determine which of the four variants are more efficient in terms of cost savings. For

purposes of calculating GPS is a company independently movable thing, which has its own technical and economic determination and operational and technical function more than one year even if its acquisition is less than 1700 euros. According to an internal directive of the depreciation written off in the first group (measuring, control, navigation and other appliances) in a balanced way. In calculating the average count rate of 10%. The annual average cost of individual treatments in the following table shows No.1

| Variant | annual depreciation | capital expenditure |
|------------------|---------------------|---------------------|
| POSTITREX | 17 678 | 70 713,20 |
| ITREK | 20 043 | 80 172,00 |
| INFOCAR | 16 964 | 67 857,20 |
| EASYTRACK | 16 643 | 66 572,00 |

| Variant | annual operating costs | annual average cost |
|------------------|------------------------|---------------------|
| POSTITREX | 29 376,00 | 54 125,62 |
| ITREK | 28 560,00 | 56 620,20 |
| INFOCAR | 24 398,40 | 48 148,42 |
| EASYTRACK | 36 720,00 | 60 020,20 |

Tab.1 The annual average cost of investment options

In terms of cost savings is considered the most effective option from Infocar with the lowest average annual cost of 48 148.42€. For comparison with this value specifies the magnitude of the cost of fuel over-compensation for the year 2009, 71 627.60€

According to interviews with the economist, these costs are spent on fuel each year, roughly comparable. For the year studied was 2009 to 2513 € 593.22. Infocar company argues that companies already use GPS devices show more than 20 percent reduction in vehicle operating costs. After supply of the GPS system for our company, this would mean a reduction in per 502,719 per year total for all vehicles. A big advantage of using GPS is that the Act recognizes the income tax on fuel costs in full, including over-compensation.

5 CONCLUSION

It based on the analysis we have made specifically advised proposals that have the potential to deliver by reducing the cost of fuel and the subsequent increase in the efficiency of its operations. Our analysis of the prices of GPS devices designed to optimize fuel consumption facilitate business decision on the selection of the optimal variant. The proposed recommendations, we discussed the company's management from them are already preparing to buy a GPS system. The planned purchase of GPS equipment, the cost of fuel consumed can be reduced by up to 20% and means of demonstration and application of the expenditure on fuel is easier. The use of fuel savers directly reduces fuel consumption by 8%.

In providing an economical vehicle operation can influence not only their fuel consumption, but also other important factors such as the amount of exhaust gases exhalátov, reliability and technical readiness of vehicles. We are interested in what the real effect of the proposed use of GPS devices for business, especially how it will impact on its performance. Brief assessment of the conclusions arising from the article.

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